
Extreme Networks BlackDiamond 10K-Series Switch Installation Guide

Extreme Networks, Inc.
3585 Monroe Street
Santa Clara, California 95051
(888) 257-3000
<http://www.extremenetworks.com>

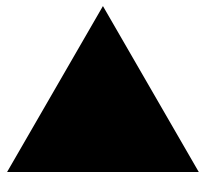
©2003 Extreme Networks, Inc. All rights reserved. Extreme Networks, ExtremeWare, BlackDiamond, and Alpine are registered trademarks of Extreme Networks, Inc. in the United States and certain other jurisdictions. ExtremeWare Vista, ExtremeWorks, ExtremeAssist, ExtremeAssist1, ExtremeAssist2, PartnerAssist, Extreme Standby Router Protocol, ESRP, SmartTraps, Summit, Summit1i, Summit4, Summit4/FX, Summit5i, Summit7i, Summit24, Summit48, Summit48i, Summit Virtual Chassis, SummitLink, SummitGbX, SummitRPS and the Extreme Networks logo are trademarks of Extreme Networks, Inc., which may be registered or pending registration in certain jurisdictions. The Extreme Turbodriven logo is a service mark of Extreme Networks, which may be registered or pending registration in certain jurisdictions. All other registered trademarks, trademarks and service marks are property of their respective owners. Specifications are subject to change without notice.

All other registered trademarks, trademarks, and service marks are property of their respective owners.

For safety compliance information, see Appendix A.

Authors: Julie Laccabue

Production: Julie Laccabue

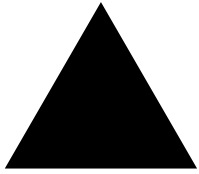


Contents

	Preface	
	Introduction	7
	Conventions	8
	Related Publications	9
	About This Guide	9
	How To Use This Guide	10
Chapter 1	BlackDiamond 10808 Switch Overview	
	Summary of Features	11
	Full-Duplex Support	12
	Management Ports	12
	Mini-GBIC Type and Hardware/Software Support	12
	Mini-GBIC Types and Specifications	12
	Safety Information	14
	Preparing to Install or Replace a Mini-GBIC	14
	Installing and Removing a Mini-GBIC	15
	XENPAK Module Installation	16
Chapter 2	Site Preparation	
	Planning Your Site	20
	Step 1: Meeting Site Requirements	20
	Step 2: Evaluating and Meeting Cable Requirements	20
	Step 3: Meeting Power Requirements	20
	Meeting Site Requirements	20
	Operating Environment Requirements	20
	Rack Specifications and Recommendations	26
	Evaluating and Meeting Cable Requirements	28
	Cabling Standards	28

Cable Labeling and Record Keeping	28
Installing Cable	29
RJ-45 Connector Jackets	32
Radio Frequency Interference	32
Making Network Interface Cable Connections	33
Meeting Power Requirements	33
Power Supply Requirements	33
AC Power Cable Requirements	34
Uninterruptable Power Supply Requirements	35
Applicable Industry Standards	36
 Chapter 3 BlackDiamond 10808 Switch Chassis	
BlackDiamond 10808 Switch Architecture	37
BlackDiamond 10808 Switch Front View	37
BlackDiamond 10808 Switch Rear View	39
BlackDiamond 10808 Switch LEDs	40
Power Socket	40
Installing the Chassis	40
Rack Installation	40
Grounding the BlackDiamond 10808 Switch	42
 Chapter 4 BlackDiamond 10808 Switch Management Module	
MSM Activity	46
MSM LEDs	47
Installing MSMs	48
Verifying the MSM Installation	50
Removing MSMs	50
 Chapter 5 BlackDiamond 10808 I/O Modules	
Configuring I/O Modules	53
G60T Module	54
G60X Module	55
10G6X Module	56
I/O Module LEDs	57
Installing I/O Modules	58
Verifying the I/O Module Installation	60
LED Indicators	60
Displaying Slot Status Information	60
Removing I/O Modules	61

Chapter 6	BlackDiamond 10808 Switch Power Supplies and Power Supply Controllers	
	Power Supply Overview	64
	Installing the Power Supplies	67
	Removing the Power Supplies	68
	Power Supply Controller Overview	69
	Installing the Power Supply Controllers	70
	Verifying a Successful Installation	70
Chapter 7	BlackDiamond 10808 Switch Fan Tray	
	BlackDiamond 10808 Switch Fan Tray	71
	Removing the BlackDiamond 10808 Switch Fan Tray	72
	Installing the Fan Tray	73
Chapter 8	Initial Switch and Management Access	
	Connecting Equipment to the Console Port	75
	Logging In for the First Time	77
Appendix A	Safety Information	
	Important Safety Information	79
	Power	79
	Power Cable	80
	Connections	81
	Lithium Battery	81
Appendix B	Switch Technical Specifications	
	Index	



Preface

This preface provides an overview of this guide, describes guide conventions, and lists other publications that might be useful.



NOTE

To ensure proper operation of your Extreme Networks equipment, read this guide before you install any Extreme Networks equipment.

Introduction

This guide provides the required information to install an Extreme Networks BlackDiamond® 10808 switch. It also contains information about site location, switch functionality, and switch operation.

This guide is intended for use by network administrators who are responsible for installing and setting up network equipment. It assumes a basic working knowledge of:

- Local area networks (LANs)
- Ethernet concepts
- Ethernet switching and bridging concepts
- Routing concepts
- Simple Network Management Protocol (SNMP)

See the *ExtremeWare XOS Concepts Guide* and the *ExtremeWare XOS Command Reference Guide* for information about configuring the BlackDiamond 10808 switch.



NOTE

If the information in the release notes that shipped with your switch differs from the information in this guide, follow the release notes.

Conventions

Table 1 and Table 2 list conventions used throughout this guide.

Table 1: Notice icons




Icon	Notice Type	Alerts you to...
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.

Table 2: Text conventions

Convention	Description
Screen displays	This typeface represents information as it appears on the screen, or command syntax.
Screen displays bold	This typeface represents commands that you type.
The words “enter” and “type”	When you see the word “enter” in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says “type.”
[Key] names	Key names appear in text in one of two ways: <ul style="list-style-type: none"> Referenced by their labels, such as “the Return key” or “the Escape key” Written with brackets, such as [Return] or [Esc] If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del].
Words in <i>italicized</i> type	Italics emphasize a point of information or denote new terms at the place where they are defined in the text.

Related Publications

The Extreme Networks switch documentation set includes:

- *Extreme Networks BlackDiamond 10808 Installation Guide*
- *ExtremeWare XOS Concepts Guide*
- *ExtremeWare XOS Command Reference Guide*
- *ExtremeWare XOS Release Notes*

Documentation for Extreme Networks products is available from the Extreme Networks website at the following location:

<http://www.extremenetworks.com/services/documentation/>

You can select and download the following Extreme Networks documentation from the Documentation section of the Services page:

- Release Notes (you must have a valid service contract to access the release notes)
- Software User Guides
- Hardware User Guides
- White Papers
- Troubleshooting Tools
- Preventative Maintenance
- Instructional Videos
- Archives

About This Guide

This guide describes how to prepare your site and how to install, maintain, and operate your Extreme Networks switch.

- **Site Planning**—Describes how to evaluate, plan, and determine the location of your Extreme Networks switch.
- **BlackDiamond Switch**—Describes the features that are specific to the BlackDiamond switch. This section provides an overview of the BlackDiamond switch, information about model types, a summary of features, and installation guidelines.
- **Switch Operation**—Describes how to power on any Extreme Networks switch, verify the switch installation, connect equipment to the console port, and log in to the switch for the first time.
- **Appendixes**—Includes information about safety requirements and technical specifications.

How To Use This Guide

Each chapter of this guide contains information on how to successfully operate your Extreme Networks BlackDiamond 10808 switch.

This guide also contains appendices that describe:

- Switch safety issues
- Switch specifications
- Module specifications

Appendix A, “Safety Information” describes important safety issues such as power, power cables, and fuses.

Appendix B, “Switch Technical Specifications” describes switch specifications such as physical dimensions, weight, certifications, and power supply parameters.

Appendix C, “Module Technical Specifications” describes module specifications such as physical dimensions, weight, and standards.

Information that is common to all modules is described at the end of the appendix.



BlackDiamond 10808 Switch Overview

The BlackDiamond 10808 switch is a chassis-based, Ethernet service core switch designed for core applications.

This chapter describes:

- Summary of Features on page 11
- Full-Duplex Support on page 12
- Management Ports on page 12
- Mini-GBIC Type and Hardware/Software Support on page 12
- XENPAK Module Installation on page 16

Summary of Features

This section describes the features of the BlackDiamond 10808 switch. If the information in the release notes differs from the information in this guide, follow the release notes. For more information about configuring the switch, refer to the *ExtremeWare XOS Concepts Guide* and the *ExtremeWare XOS Command Reference Guide*.

The features of the BlackDiamond 10808 switch include:

- A 10-slot chassis that can be populated with up to eight input/output (I/O) modules and two Management Switch Fabric Modules (MSM-1 and MSM-1XL)
- I/O modules that are hot-swappable, and include Gigabit Ethernet copper ports (10/100/1000) and Gigabit Ethernet fiber ports (SFP), or 10 Gigabit Ethernet ports
- Redundant, load-sharing, hot-swappable power supplies
- Field-replaceable, hot-swappable fan trays
- Autonegotiation for half-duplex or full-duplex operation on 10/100/1000 Mbps ports
- Load-sharing on multiple ports

Full-Duplex Support

Extreme Networks switches provide full-duplex support for all ports. This means that frames can be transmitted and received simultaneously, which, in effect, doubles the bandwidth available on a link. Most ports on an Extreme Networks switch autonegotiate for half-duplex or full-duplex operation. Gigabit Ethernet fiber ports and 10 Gigabit Ethernet ports operate in full-duplex mode only in accordance with technical standards.

Management Ports

The 10/100BASE-TX Ethernet management port allows you to communicate directly to the CPU of the switch. You can plug an Ethernet cable directly from your laptop into the management port, which provides you with direct access into the switch. This access allows you to view and locally manage the switch configurations.

Do not assign an in-band IP address to the management port VLAN. The management port VLAN is an out-of-band VLAN, so if it is assigned an in-band IP address (an address where the source and destination are in the same subnet), the switch will treat it as a normal VLAN and attempt to route traffic through it.

The management port is located on the following Extreme Networks devices:

- BlackDiamond—Management Switch Fabric Module (MSM-1 and MSM-1XL)
 - The MSM-1XL has 256,000 entries in its lookup tables versus 128,000 entries in the MSM-1. The MSM-1XL is necessary to support BGP-4.

Extreme Networks does not recommend that you use the management port to route traffic to any front panel port on the switch. The management port is designed for switch management purposes.

Mini-GBIC Type and Hardware/Software Support

The BlackDiamond 10808 switch supports the small form pluggable (SFP) GBIC, also known as the mini-GBIC. The switches and the modules identify the type of mini-GBIC that is installed and verifies that the mini-GBIC is an Extreme Networks-certified mini-GBIC.

Mini-GBIC Types and Specifications

The three types of mini-GBIC interfaces are:

- SX mini-GBIC, which conforms to the 1000BASE-SX standard
- LX mini-GBIC, which conforms to the 1000BASE-LX standard
- ZX mini-GBIC, which conforms to the IEEE 802.3z standard

Use only Extreme Networks-certified mini-GBICs, available from Extreme Networks, into the mini-GBIC port in the switch or module.

Table 3 describes the specifications for the SX mini-GBIC interface, Table 4 describes the specifications for the LX mini-GBIC interface, and Table 5 describes the specifications for the ZX mini-GBIC interface.

Table 3: SX mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transceiver			
Optical output power	-9.5 dBm		-4 dBm
Center wavelength	830 nm	850 nm	860 nm
Receiver			
Optical input power sensitivity	-21 dBm		
Optical input power maximum			-4 dBm
Operating wavelength	830 nm		860 nm
General			
Total system budget			11.5 dB

Total optical system budget for the SX mini-GBIC is 11.5 dB. Extreme Networks recommends that 3 dB of the total budget be reserved for losses induced by cable splices/connectors and operating margin. While 8.5 dB remains available for cable induced attenuation, the 1000BASE-SX standard specifies supported distances of 275 meters over 62.5 micron multimode fiber and 550 meters over 50 micron multimode fiber. There is no minimum attenuation or minimum cable length restriction.

Table 4: LX mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transceiver			
Optical output power	-9.5 dBm		-3 dBm
Center wavelength	1275 nm	1310 nm	1355 nm
Receiver			
Optical input power sensitivity	-23 dBm		
Optical input power maximum			-3 dBm
Operating wavelength	1270 nm		1355 nm
General			
Total system budget			13.5 dB

Total optical system budget for the LX mini-GBIC is 13.5 dB. Measure cable plant losses with a 1310 nm light source and verify this to be within budget. When you calculate the maximum distance attainable using optical cable with a specified loss per kilometer (for example 0.25 dB/km), Extreme Networks recommends that 3 dBm of the total budget be reserved for losses induced by cable splices/connectors and operating margin. Thus, 10.5 dB remains available for cable induced attenuation. There is no minimum system budget or minimum cable length restriction because the maximum receive power is the same as the maximum transmit power. There is no minimum attenuation or minimum cable length restriction.

Table 5: ZX mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transceiver			
Optical output power	-2 dBm	0 dBm	3 dBm
Center wavelength	1540 nm	1550 nm	1570 nm
Receiver			
Optical input power sensitivity	-23 dBm		
Optical input power maximum			-3 dBm
Operating wavelength	1540 nm	1550 nm	1570 nm

Safety Information

Before you begin the process of installing or replacing a mini-GBIC, read the safety information in this section.



CAUTION

Mini-GBICs can emit invisible laser radiation. Avoid direct eye exposure to beam.

Mini-GBICs are Class 1 laser devices, and they operate at 3.3 V. Use only Extreme Networks-certified mini-GBIC devices.

If you see an amber blinking mini-GBIC port status LED after you install a mini-GBIC into a BlackDiamond 10K-series module, this means the mini-GBIC is not certified by Extreme Networks. To correct this problem, install an Extreme Networks-certified mini-GBIC, available from Extreme Networks, into the mini-GBIC port.

If you install a mini-GBIC not certified by Extreme Networks into a BlackDiamond 10K-series module and insert a cable to bring up the link, the port status LED remains “off” and an error specifying the use of a non-Extreme Networks-certified mini-GBIC is sent to the syslog. To view the syslog and to determine why the link is down, use the `show log` command. To correct this problem, install an Extreme Networks-certified mini-GBIC, available from Extreme Networks, into the mini-GBIC slot in the module.

Preparing to Install or Replace a Mini-GBIC

To ensure proper installation, complete the following five tasks before inserting the mini-GBIC:

- 1 Disable the port that is needed to install or replace the mini-GBIC.
- 2 Inspect and clean the fiber tips, coupler, and connectors.
- 3 Prepare and clean an external attenuator, if needed.
- 4 Do not stretch the fiber.
- 5 Make sure the bend radius of the fiber is not less than 2 inches (5.08 cm).

In addition to the previously described tasks, Extreme Networks recommends the following when installing or replacing mini-GBICs on an active network:

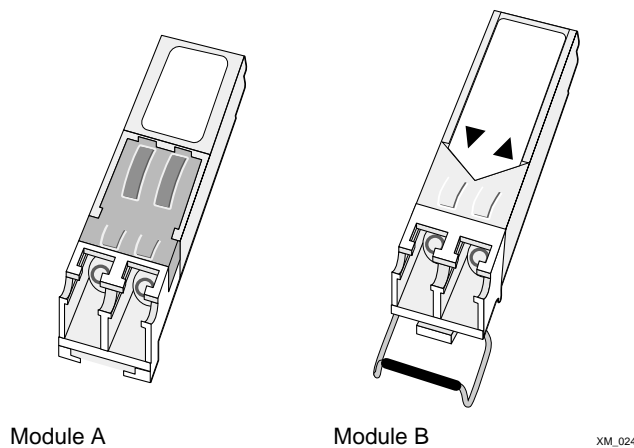
- Use the same type of mini-GBIC at each end of the link.
- Connect one end of the link to the Tx port. Without an attenuator, measure the total loss from the Tx port to the other site of the link. The total loss must not exceed the total optical system budget.

After you complete these described tasks, you are ready to install or replace a mini-GBIC.

Installing and Removing a Mini-GBIC

You can add mini-GBICs into, or remove mini-GBICs from your BlackDiamond 10808 switch without powering off the system. Figure 1 shows the two types of mini-GBIC connectors.

Figure 1: Mini-GBIC modules



Mini-GBICs are a 3.3 V Class 1 laser devices. Use only Extreme-approved devices.



CAUTION

Mini-GBICs can emit invisible laser radiation. Avoid direct eye exposure to beam.



NOTE

Remove the LC fiber-optic connector from the mini-GBIC prior to removing the mini-GBIC from the switch.

If you see an amber blinking mini-GBIC port status LED, the mini-GBIC installed in your switch or module is not approved, supported, or certified by Extreme Networks. To correct this problem, install an Extreme Networks-certified mini-GBIC.

To remove a mini-GBIC similar to the one labeled “Module A” in Figure 1, gently press and hold down the black plastic tab at the bottom of the connector to release the mini-GBIC, and pull the mini-GBIC out of the SFP receptacle.

To remove a mini-GBIC connector similar to the one labeled “Module B” in Figure 1, gently rotate the front handle and pull the mini-GBIC out of the SFP receptacle.

To insert a mini-GBIC connector:



NOTE

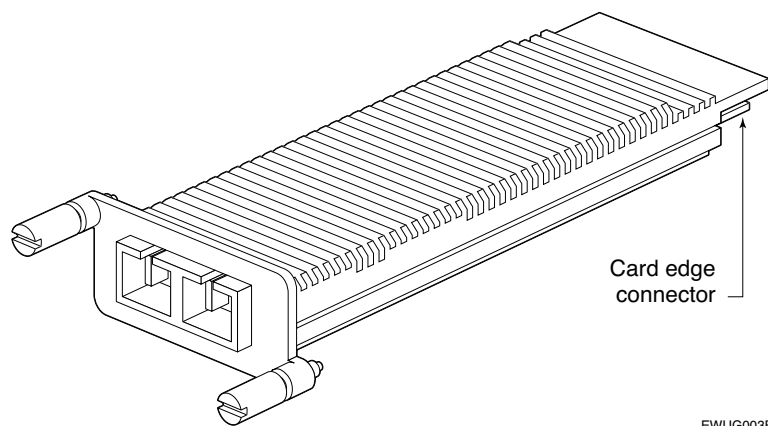
Mini-GBICs can be installed in the SFP mini-GBIC receptacles only.

- 1 Holding the mini-GBIC by its sides, insert the mini-GBIC into the SFP receptacle on the switch or module.
- 2 Slide the mini-GBIC into the SFP receptacle until you hear an audible click, indicating the mini-GBIC is securely seated into the SFP receptacle. If the mini-GBIC has a handle, push up on the handle to secure the mini-GBIC.

XENPAK Module Installation

This section describes installing and removing the XENPAK module, a 10 Gbps optical transceiver. You can install or remove the XENPAK module from your Extreme Networks switch without powering off the system. The module is shown in Figure 2.

Figure 2: XENPAK module



The XENPAK module is a Class 1 laser device. Use only Extreme-approved devices on all Extreme switches.



CAUTION

The XENPAK module can emit invisible laser radiation. Avoid direct eye exposure to beam.



WARNING!

To prevent ESD damage to the XENPAK module, always use an appropriately grounded ESD-preventive wrist strap when installing or removing the module. Handle the module by its sides only. Never touch the card-edge connectors at the insertion end of the module.

To install a XENPAK module:

- 1 Remove the XENPAK module from its antistatic container and remove the dust covers from the module optical connectors. If your module has a protective pad covering the card-edge connector, remove it. Store the antistatic container, dust covers, and card-edge connector protective pad in a clean location from which they can be easily retrieved if you need to uninstall the module.
- 2 Remove any dust covers from the port on the module into which you are installing the XENPAK.
- 3 Holding the module by its sides, insert it into the slot on the I/O module.
- 4 Slide the module as far back into the slot as possible, until you hear it click, indicating that it is firmly attached.
- 5 Secure the module to the I/O module faceplate by turning the two captive screws clockwise until they are hand-tight.



NOTE

To ensure that your module is undamaged upon installation, you can correlate factory test data with your installation site test data by consulting the average power reference values shown on the XENPAK module test data sheet (Part No. 121074-00) enclosed with your module.

To remove a XENPAK module:

- 1 Turn the two captive screws counter-clockwise until they are completely free from the I/O module faceplate. (The captive screws remain attached to the XENPAK module.)



WARNING!

Remove the SC fiber-optic connector from the XENPAK module prior to removing the XENPAK module from the I/O module.

- 2 Gripping both captive screws, gently pull the XENPAK Module out of the slot.
- 3 Place the dust covers back into the XENPAK Module connectors.
- 4 Place the XENPAK module immediately into an antistatic container to protect it from ESD damage and dust.

2

Site Preparation

This chapter describes how to prepare your site for installing Extreme Networks equipment. It contains information on environmental and cabling requirements, power requirements, and building and electrical code organizations.

This chapter describes:

- Planning Your Site on page 20
- Meeting Site Requirements on page 20
- Evaluating and Meeting Cable Requirements on page 28
- Meeting Power Requirements on page 33
- Applicable Industry Standards on page 36

The requirements described in this chapter are intended for the system administrator, network equipment technician, or network manager who is responsible for installing and managing the network hardware. It assumes a working knowledge of local area network (LAN) operations, and a familiarity with communications protocols that are used on interconnected LANs. Installation, maintenance, and removal of a switch, chassis, or its components must be done by qualified service personnel only.

Qualified service personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves or other people.

By carefully planning your site, you can maximize the performance of your existing network and ensure that it is ready to migrate to future networking technologies.

To learn more about safety issues and to ensure safety compliance, see Appendix A.



WARNING!

Read the safety information in Appendix A thoroughly before installing your Extreme Networks switch. Failure to follow this safety information can lead to personal injury or damage to the equipment.

Planning Your Site

To install your equipment successfully, you should plan your site carefully. The site planning process has three major steps:

Step 1: Meeting Site Requirements

Your physical installation site must meet several requirements for a safe and successful installation:

- Building and electrical code requirements
- Environmental, safety, and thermal requirements for the equipment you plan to install
- Distribution rack requirements

Step 2: Evaluating and Meeting Cable Requirements

After examining your physical site and ensuring all environment requirements are met, you should evaluate and compare your existing cable plant with the requirements of the Extreme Networks equipment to determine if you need to install new cables (or cabling).

Step 3: Meeting Power Requirements

To run your equipment safely, you must meet the specific power requirements for the Extreme Networks equipment that you plan to install.



Review and follow the safety information before you install your equipment.

Meeting Site Requirements

This section addresses the various requirements to consider when preparing your installation site, including:

- Operating Environment Requirements
- Rack Specifications and Recommendations

Operating Environment Requirements

You need to verify that your site meets all environmental and safety requirements.

Virtually all areas of the United States are regulated by building codes and standards. During the early planning stages of installing or modifying your LAN, it is important that you develop a thorough understanding of the regulations that pertain to your location and industry.

Building and Electrical Codes

Building and electrical codes vary depending on your location. Comply with all code specifications when planning your site and installing cable. The following sections are provided as a resource to obtain additional information.

Three major building codes are:

- Uniform Building Code—produced by the International Conference of Building Officials (ICBO); 5360 South Workman Mill Road; Whittier, California 90601 USA. www.icbo.org
- BOCA Basic Building Code—produced by the Building Officials and Code Administrators (BOCA) International, Inc.; 4051 West Flossmoor Road; Country Club Hills, Illinois 60478 USA. www.bocai.org
- Standard Building Code (SBC)—produced by the Southern Building Code Congress International, Inc.; 900 Montclair Road; Birmingham, Alabama 35213 USA. www.sbcci.org

Five authorities on electrical codes are:

- National Electrical Code (NEC) Classification (USA only)—a recognized authority on safe electrical wiring. Federal, state, and local governments use NEC standards to establish their own laws, ordinances, and codes on wiring specifications. The NEC classification is published by the National Fire Protection Association (NFPA). The address is NFPA; 1 Batterymarch Park; Quincy, Massachusetts 02269 USA. www.nfpa.org
- Underwriters' Laboratory (UL) (USA only)—an independent research and testing laboratory. UL evaluates the performance and capability of electrical wiring and equipment to determine whether they meet certain safety standards when properly used. Acceptance is usually indicated by the words "UL Approved" or "UL Listed." The address is UL; 333 Pfingsten Road; Northbrook, Illinois 60062-2096 USA. www.ul.com
- National Electrical Manufacturing Association (NEMA) (USA only)—an organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components. The address is NEMA; 2101 L Street N.W.; Washington, D.C. 20037 USA. www.nema.org
- Electronics Industry Association (EIA)—a trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry. The address is EIA; 2001 Eye Street N.W.; Washington, D.C. 20006 USA. www.eia.org
- Federal Communications Commission (FCC)—a commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of 1934. The FCC regulates all U.S. telephone and cable systems. The address is FCC; 1919 M Street N.W.; Washington, D.C. 20554 USA.

Wiring Closet Considerations

You should consider the following recommendations for your wiring closet:

- Ensure that your system is easily accessible for installation and service. See “Rack Specifications and Recommendations” on page 26 for specific recommendations.
- Use appropriate AC power for your switch, as described in Table 6.

Table 6: AC power requirements

Country	Requirements
North America	13 A service receptacle, NEMA 5-15 for 110/220 VAC power supplies.
United Kingdom	10 A service receptacle, BS 1363 for 110/220 VAC power supplies.
International	10 A service receptacle, CEE 7/7 for 110/220 VAC power supplies.
Australia	10 A service receptacle, AS 3112 for 110/220 VAC power supplies.
Japan	15 A service receptacle, JIS 8303 for 110/220 VAC power supplies.

- Use a vinyl floor covering in your wiring closet. (Concrete floors accumulate dust, and carpets can cause static electricity.)
- Prevent unauthorized access to wiring closets by providing door locks. Install the equipment in a secured, enclosed, and restricted-access area, ensuring that only qualified service personnel have access to the equipment.
- Provide adequate overhead lighting for easy maintenance.
- Ensure that each wiring closet has a suitable ground. All distribution racks and equipment installed in the closet should be grounded.
- Ensure that all system environmental requirements are met, such as ambient temperature and humidity.



NOTE

Extreme Networks recommends that you consult an electrical contractor for commercial building and wiring specifications.

Temperature. Extreme Networks equipment generates a significant amount of heat. It is essential that you provide a temperature-controlled environment for both performance and safety.

Install the equipment only in a temperature- and humidity-controlled indoor area that is free of airborne materials that can conduct electricity. Too much humidity can cause a fire. Too little humidity can produce electrical shock and fire.

The following are some general thermal recommendations for your wiring closet:

- Ensure that the ventilation in the wiring closet is adequate to maintain a temperature below 104° F (40° C).
- Install a reliable air conditioning and ventilation system.
- Keep the ventilation in the wiring closet running during nonbusiness hours; otherwise, the equipment can overheat.

- Maintain ambient operating temperature: 32° to 104° F (0° to 40° C).
- Maintain storage temperature: -40° to 158° F (-40° to 70° C).

**NOTE**

Like all electrical equipment, product lifetimes degrade with increased temperature. If possible, temperatures should be kept at approximately 78° F (25° C) or lower.

Spacing Requirements. Due to chassis-to-chassis heating, Extreme Networks recommends placing no more than three BlackDiamond 10808 chassis next to each other.

The following are some general recommendations for installing your BlackDiamond 10808 switch:

- A minimum of 17.32 inches (44 cm) between each set of three BlackDiamond 10808 switch.
- Or
- Place patch panels, which are used to patch cables together, between each set of three BlackDiamond BlackDiamond 10808 switches. A patch panel does not require any power and does not generate any heat.

**NOTE**

Up to five adjacent BlackDiamond 10808 switches will continue to function without safety concerns. However, product lifetime may degrade with continued exposure to high temperatures in close proximity and long term reliability may be compromised.

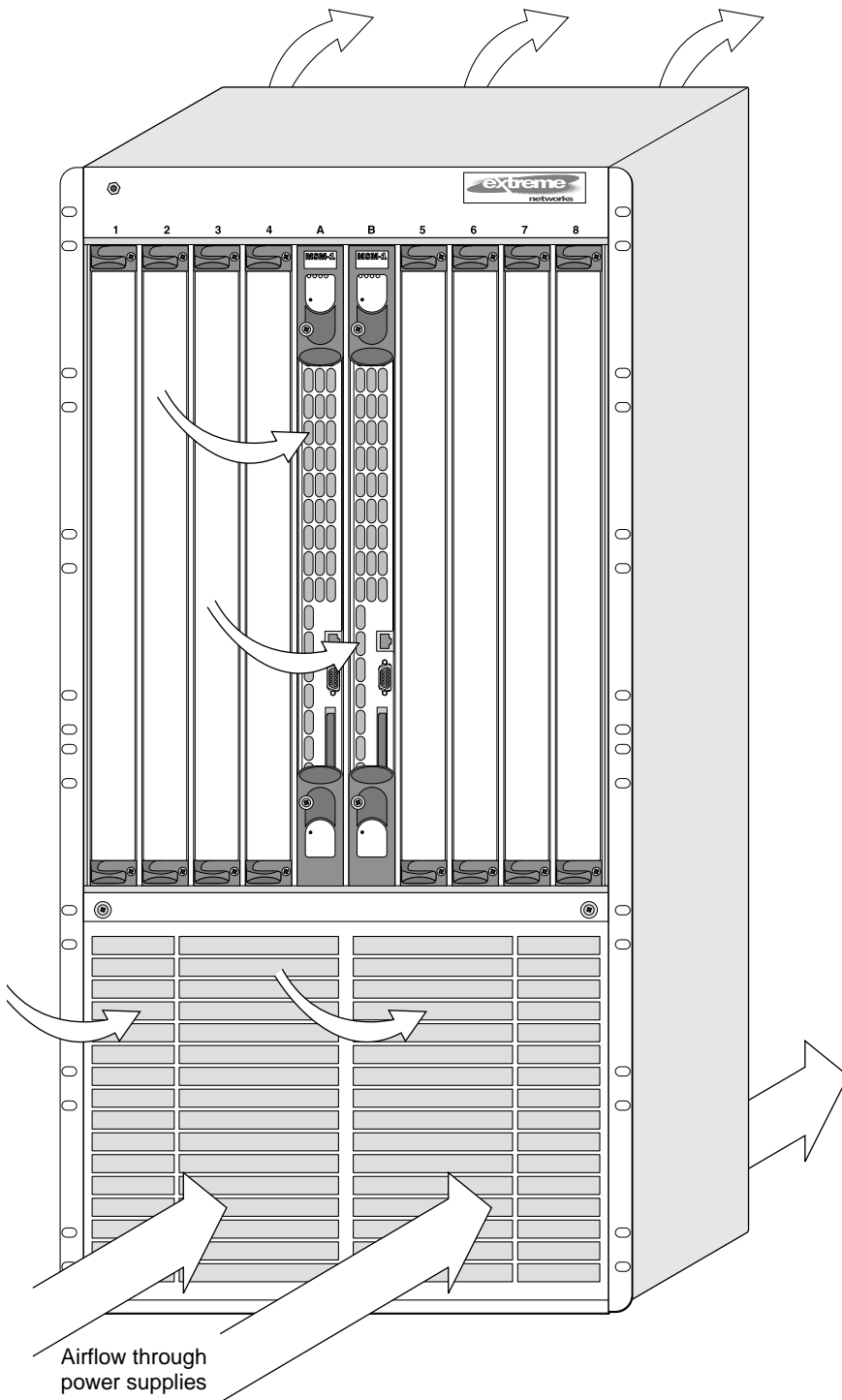
Airflow Requirements. To ensure proper airflow through an Extreme Networks switch, refer to the following recommendations when you are installing your switch:

- The BlackDiamond 10808 switch requires 3 inches (7.62 cm) around both the front and rear of the chassis (5 inches (12.7 cm) recommended) for proper airflow.

The airflow of the BlackDiamond 10808 switch moves through the power supplies and is independent of the airflow through the modules as shown in Figure 3. For example, if the power supply fans fail, the airflow through the module area of the chassis will not cool down the power supplies.

- Airflow for cooling power supplies moves front to back as you face the chassis.
- Airflow for cooling modules moves left to right as you face the chassis.

Figure 3: Airflow through the BlackDiamond 10808 switch chassis



EX_010

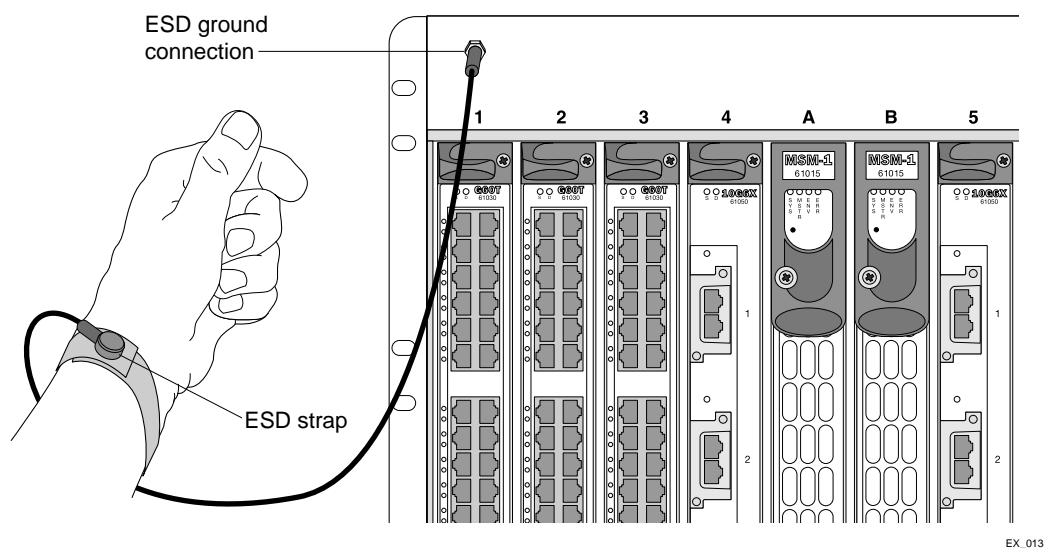
Humidity. Operating humidity should be kept between 10 and 95% relative humidity (noncondensing).

Electrostatic Discharge (ESD)

Your system must be protected from static electricity. Take the following measures to ensure optimum system performance:

- Keep relative humidity at 50 to 70%.
- Remove materials that can cause electrostatic generation (such as synthetic resins) from the wiring closet. Check the appropriateness of floor mats and flooring.
- Connect conductors (metals, etc.) to ground, using dedicated grounding lines.
- Use electrostatically safe equipment and the ESD straps that are provided with your equipment. All BlackDiamond switches come with ESD wrist strap connectors and wrist straps as shown in Figure 4.

Figure 4: Ensure that you use an ESD wrist strap when handling switch components



EX_013

Rack Specifications and Recommendations

Racks should conform to conventional standards. In the United States, use EIA Standard RS-310C: Racks, Panels, and Associated Equipment. In countries other than the United States, use IEC Standard 297. In addition, verify that your rack meets the basic mechanical and space requirements that are described in this section.

Mechanical Recommendations for the Rack

Use distribution racks that meet the following mechanical recommendations:

- Use an open style, 19-inch (48.26 cm) rack to facilitate easy maintenance and to provide proper ventilation.
- The rack should use the universal mounting rail hole pattern that is identified in IEC Standard 297.
- The mounting holes should be flush with the rails to accommodate the chassis.
- Use a rack made of steel or aluminum.
- Install equipment into the lower half of the rack first to avoid making the rack top-heavy.
- The rack should support approximately 600 pounds (272 kilograms).

Protective Grounding for the Rack

Use a rack grounding kit and a ground conductor that is carried back to earth or to another suitable building ground.

All Extreme Networks switches are designed with mounting brackets that provide solid metal-to-metal connection to the rack. If you do not use equipment racks, you can attach wiring terminals directly to the mounting brackets for appropriate grounding. BlackDiamond products have grounding terminals that are mounted on the back of the chassis.

At minimum, follow these guidelines:

- Ground equipment racks to earth ground.
 - CAD weld appropriate wire terminals to building I-beams or earth ground rods.
 - Use #4 copper wire.
 - Drill and tap wire terminals to equipment racks.
 - Position the earth ground as close to the equipment rack as possible to maintain the shortest wiring distance possible.
 - Properly test the quality of the earth ground.



Because building codes vary worldwide, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding is in place for your specific installation.

- Ground DC power supplies to earth ground by using the grounding terminals provided.

Space Requirements for the Rack

Provide enough space in front of and behind the switch so that you can service it easily. Allow a minimum of 48 inches (122 cm) in front of the rack and 24 inches (61 cm) behind the rack. When using a relay rack, provide a minimum of 24 inches (61 cm) of space behind the mounted equipment. Extra room on each side is optional.



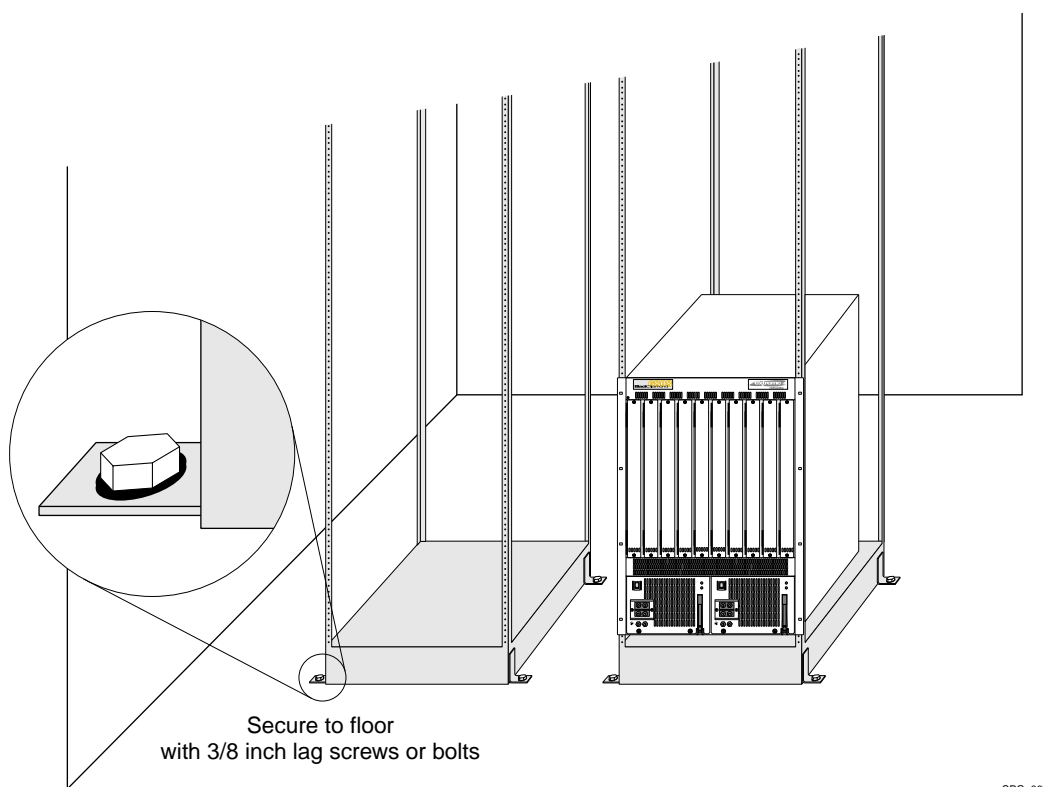
NOTE

Install your equipment rack near an easily accessible power outlet. When you need to disconnect the power cable from your switch, remove it first from the power source and then from the switch.

Securing the Rack

The rack should be attached to the wiring closet floor with 3/8 inch (9.5 mm) lag screws or equivalent hardware. The floor under the rack should be level within 3/16 inch (5 mm). Use a floor-leveling cement compound if necessary or bolt the racks to the floor as shown in Figure 5.

Figure 5: Properly secured rack



SPG_007

Brace open distribution racks if the channel thickness is less than 1/4 inch (6.4 mm).

Evaluating and Meeting Cable Requirements

This section addresses requirements for the cable you should use when installing your network equipment. It includes:

- Cabling Standards
- Cable Labeling and Record Keeping
- Installing Cable
- RJ-45 Connector Jackets
- Radio Frequency Interference

Cabling Standards

Extreme Networks recommends using the BICSI (Building Industry Consulting Service International) RCDD (Registered Communications Distribution Designer), which is globally recognized as a standard in site planning and cabling. For information, go to:

<http://www.bicsi.org>

Cable Labeling and Record Keeping

A reliable cable labeling system is essential when planning and installing a network. Maintaining accurate records helps you to:

- Relocate devices easily.
- Make changes quickly.
- Isolate faults in the distribution system.
- Locate the opposite end of any cable.
- Know the types of network devices that your cabling infrastructure can support.

Consider the following recommendations when setting up a cable labeling system suitable for your installation:

- Identify cables by securely attaching a label to all cable ends.
- Assign a unique block of sequential numbers to the group of cables that run between each pair of wiring closets.
- Assign a unique identification number to each distribution rack.
- Identify all wiring closets by labeling the front panel of your Extreme Networks equipment and other hardware.
- Keep accurate and current cable identification records.
- Post records near each distribution rack. Include the following cable drop information: the cable source, destination, and jumper location.

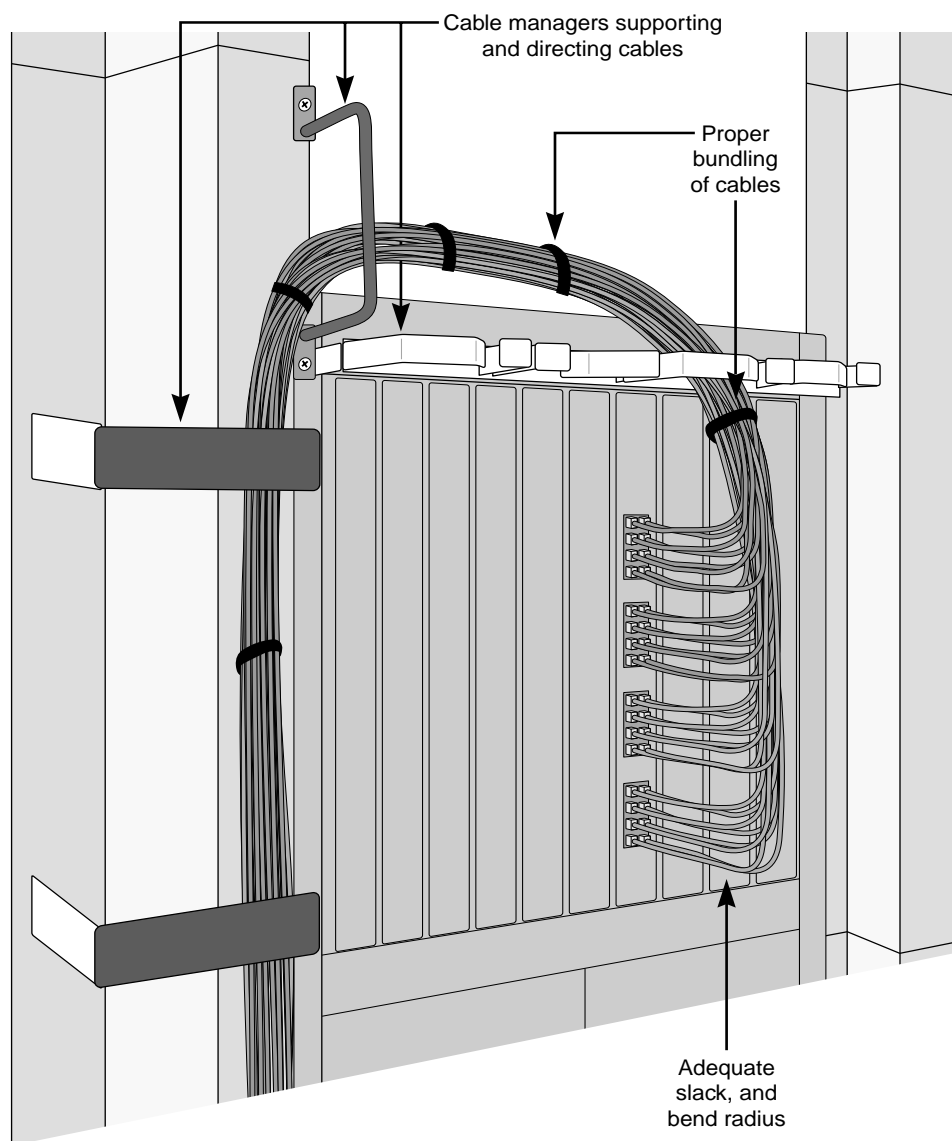
Installing Cable

Consider the following recommendations when you connect cable to your network equipment:

- Examine cable for cuts, bends, and nicks.
- Support cable using a cable manager that is mounted above connectors to avoid unnecessary weight on the cable bundles.
- Use cable managers to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Provide enough slack—approximately 2 to 3 inches (5.08-7.62 cm)— to provide proper strain relief as shown in Figure 6.
- Bundle cable using velcro straps to avoid injuring cables.
- If you build your own cable, ensure that cable is properly crimped.
- When installing a patch panel using twisted pair wiring, untwist no more than 1 inch (2.54 cm) of the cable to avoid RF interference.
- When required for safety and fire rating requirements, use plenum-rated cable. See your local building codes for determining when it is appropriate to use plenum-rated cable, or refer to IEC standard 850.
- Keep all ports and connectors free of dust.



Unshielded twisted pair (UTP) cable can build up ESD charges when being pulled into a new installation. Before installing category 5 UTP cables, discharge ESD from the cable by plugging it into a port on a switch or any network device that is not powered on.

Figure 6: Properly installed and bundled cable

SPG_008

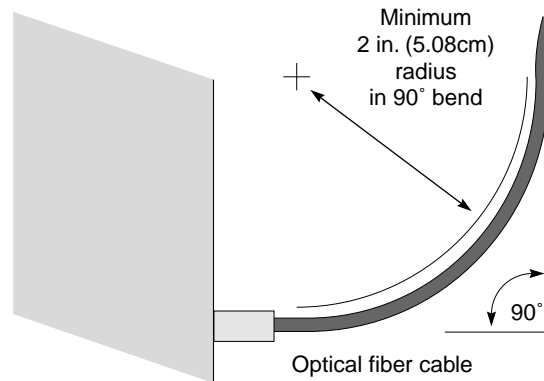
Fiber Optic Cable

Fiber optic cable must be treated gently during installation. Every cable has a minimum bend radius, for example, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. We recommend that the bend radius for fiber optic cable equals 2-inch (5.08 cm) minimum for each 90 degree turn as shown in Figure 7.



NOTE

Kinks and sharp bends can destroy or impair the cable's ability to convey light pulses accurately from one end of the cable to the other. Use care in dressing the optical-fiber cables: provide satisfactory strain relief to support the cable and maintain an adequate bend radius at all cable turns, particularly where the cable connects to the I/O module.

Figure 7: Bend radius for fiber optic cable

SPG_002

Cable Distances

Table 7 shows cable media types and maximum distances that support reliable transmission in accordance with international standards except where noted.

Table 7: Media types and maximum distances

Standard	Media Type	Mhz•Km Rating	Maximum Distance (Meters)
1000BASE-SX (850 nm optical window)	50/125 μ m multimode fiber	400	500
	50/125 μ m multimode fiber	500	550
	62.5/125 μ m multimode fiber	160	220
	62.5/125 μ m multimode fiber	200	275
1000BASE-LX (1300 nm optical window)	50/125 μ m multimode fiber	400	550
	50/125 μ m multimode fiber	500	550
	62.5/125 μ m multimode fiber	500	550
	10/125 μ m single-mode fiber	—	5,000
	10/125 μ m single-mode fiber*	—	10,000
1000BASE-LX70 (1550 nm optical window)	10/125 μ m single-mode fiber	—	70,000
1000BASE-T	Category 5 and higher UTP cable	—	100
100BASE-TX	Category 5 and higher UTP cable	—	100
10BASE-T	Category 3 and higher UTP cable	—	100

* Proprietary to Extreme Networks. Connections between two Extreme Networks 1000BASE-LX interfaces that use 10/125 μ m single-mode fiber can use a maximum distance of 10,000 meters.

RJ-45 Connector Jackets

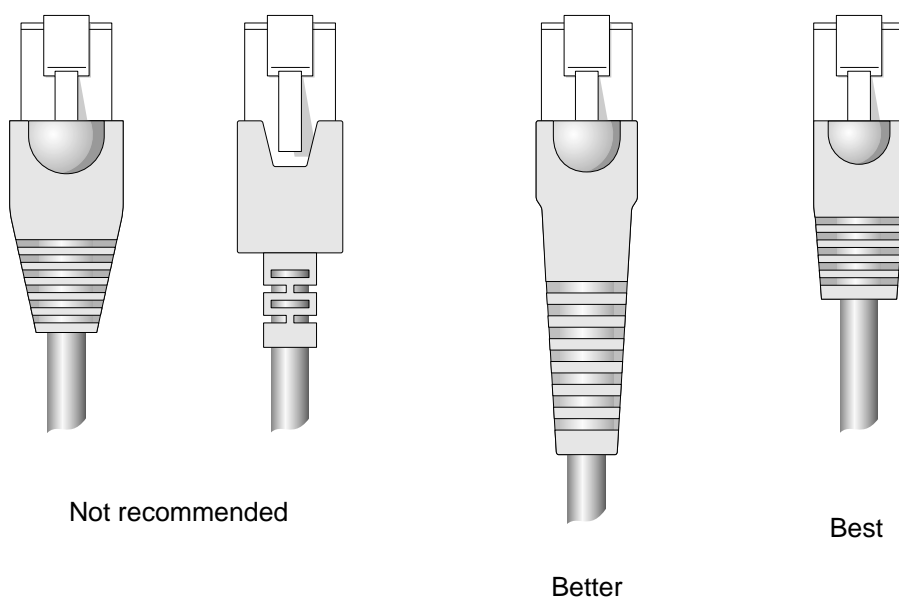
Use RJ-45 cable with connector jackets that are flush with the connector or that have connectors with a no-snag feature.

Using cable with jackets that are wider than the connectors can cause:

- Connectors that are not properly aligned with the port.
- Crowded cable installation, which can cause connectors to pop out of the port.

Figure 8 shows examples of connector jacket types that are not recommended as well as those that are recommended.

Figure 8: RJ-45 connector jacket types



SPG_001

Radio Frequency Interference

If you use unshielded twisted pair (UTP) cabling in an installation, take precautions to avoid radio frequency (RF) interference. RF interference can cause degradation of signal quality, and, in an Ethernet network environment, can cause excessive collisions, loss of link status, or other physical layer problems that can lead to poor performance or loss of communication.

To prevent RF interference, avoid the following devices or situations:

- Attaching UTP cable to AC power cables
- Routing UTP cable near antennas, such as a Ham radio antenna
- Routing UTP cable near equipment that could exhibit RF interference, such as:
 - ARC welding equipment
 - Electrical motors that contain coils
 - Air conditioner units
 - Electrical transformers

In areas or applications where these situations cannot be avoided, use fiber optic cabling or shielded twisted pair cabling (STP).



NOTE

Because harmonics can appear on the neutral line of a typical three-phase power circuit, Extreme Networks recommends using a harmonics meter in new installations.

Making Network Interface Cable Connections

Use the appropriate type of cable to connect the ports of your switch to another switch or router.

Working carefully, one port at a time, follow these steps:

- 1 Verify that you have identified the correct cable for the port.
- 2 Use an alcohol wipe or other appropriate cleaning agent to clean the cable connectors; make sure they are free of dust, oil, and other contaminants.
- 3 If you are using optical-fiber cable, align the transmit (Tx) and receive (Rx) connectors with the correct corresponding connectors on the switch or the I/O module.
- 4 Press the cable connectors into their mating connectors on the switch or I/O module until the cable connector is firmly seated.
- 5 Repeat steps 1 through 4 for the remaining cables on this or other switches or I/O modules.
- 6 Dress and secure the cable bundle to provide appropriate strain relief and protection against bends and kinks.

Meeting Power Requirements

This section discusses power requirements, including:

- Power Supply Requirements
- AC Power Cable Requirements
- Uninterruptable Power Supply Requirements

For more information about the power specifications of the Extreme Networks family of switches, see Appendix B, “Switch Technical Specifications” on page 83.

Power Supply Requirements

Adhere to the following requirements in order to operate your Extreme Networks equipment safely:

- Ensure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Ensure that your power supply meets the site power, AC power, or DC power requirements of the network equipment.
- Ensure that DC connections are made by an on-site electrician.

**NOTE**

For power specifications for Extreme Networks products, see the Extreme Networks website at <http://www.extremenetworks.com>.

- When connecting power to installed equipment, avoid connecting through an extension cord or power strip.
- If your switch includes more than one power supply, connect each power supply to different, independent power sources. If a power source fails, it will only affect the switch power supply to which it is connected. If all switch power supplies are connected to a single power source, the entire switch is vulnerable to a power source failure.

AC Power Cable Requirements

Use an AC power cable appropriate for your country. Check your local electrical codes and regulatory agencies for power cable requirements. The countries listed in Table 8 have the following additional requirements.

Table 8: AC power cable requirements

Country	Requirements
USA and Canada	<ul style="list-style-type: none"> • The cable set must be UL-approved and CSA-certified. • The minimum specification for the flexible cable is No. 18 AWG (1.5 mm ²), Type SVT or SJT, 3-conductor. • The cable set must have a rated current capacity of at least the amount rated for each specific product. • The attachment plug must be an Earth-grounding type with a NEMA 5-15P (10 A, 125 V) configuration.
Denmark	The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
Argentina	The supply plug must comply with Argentinian standards.

**NOTE**

When using dual power supplies, make sure that each AC power supply attaches to an independent power source.

Replacing the Power Cable

If the power cable plug is unsuitable and must be replaced, connect the power supply wires for the switch according to the following scheme:

- Brown wire to the Live (Line) plug terminal, which may be marked with the letter “L” or colored red.
- Blue wire to the Neutral plug terminal, which may be marked with the letter “N” or colored black.
- Yellow/Green wire to the Ground plug terminal, which may be marked with the letter “E” (the Earth symbol) or colored yellow/green.

Uninterruptible Power Supply Requirements

An uninterruptible power supply (UPS) is a device that sits between a power supply (such as a wall outlet) and a device (such as a switch) to prevent outages, sags, surges, and bad harmonics from adversely affecting the performance of the device.

UPS Features

A UPS traditionally can perform the following functions:

- Absorb relatively small power surges.
- Smooth out noisy power sources.
- Continue to provide power to equipment during line sags.
- Provide power for some time after a blackout has occurred.

In addition, some UPS or UPS plus software combinations provide the following functions:

- Automatic shutdown of equipment during long power outages.
- Monitoring and logging of power supply status.
- Display the voltage (current draw) of the equipment.
- Restart equipment after a long power outage.
- Display the voltage currently on the line.
- Provide alarms on certain error conditions.
- Provide short circuit protection.

Selecting a UPS

To determine UPS requirements for your switch, ask these questions:

- What are the amperage requirements?
- What is the longest potential time period that the UPS would be required to supply backup power?
- Where will the UPS be installed?
- What is the maximum transition time that your installation will allow?



NOTE

Extreme Networks recommends that you use a UPS that provides online protection.

Calculating Amperage Requirements

To determine the size of UPS that you need, use the following procedure:

- 1 To find VA (Volt-Amps), locate the voltage and amperage requirements for each piece of equipment. These numbers are usually located on a sticker on the back or bottom of your equipment. Then multiply the numbers together to get VA:

$$\text{VA} = \text{Volts} \times \text{Amperes}$$

- 2 Add the VA from each piece of equipment together to find the total VA requirement.

To determine the minimum amperage requirements for your UPS, we recommend that you add 30% to the total.

UPS Transition Time

Transition time is the time that is necessary for the UPS to transfer from utility power to full-load battery power. For Extreme Networks products, a transition time of less than 20 milliseconds is required for optimum performance.

Applicable Industry Standards

For more information, see the following ANSI/TIA/EIA standards:

- ANSI/TIA/EIA-568-A—discusses the six subsystems of a structured cabling system.
- ANSI/TIA/EIA-569-A—discusses design considerations.
- ANSI/TIA/EIA-606—discusses cabling system administration.
- ANSI/TIA/EIA-607—discusses commercial building grounding and bonding requirements.

You can access these standards at

<http://www.ansi.org/>

or

<http://www.tiaonline.org/>.

3

BlackDiamond 10808 Switch Chassis

This chapter describes:

- BlackDiamond 10808 Switch Architecture on page 37
- Installing the Chassis on page 40



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove any BlackDiamond 10808 switch.

BlackDiamond 10808 Switch Architecture

This section describes and shows the architecture of the BlackDiamond 10808 switch:

- BlackDiamond 10808 Switch Front View on page 37
- BlackDiamond 10808 Switch Rear View on page 39
- BlackDiamond 10808 Switch LEDs on page 40

BlackDiamond 10808 Switch Front View

The BlackDiamond 10808 switch consists of the following components:

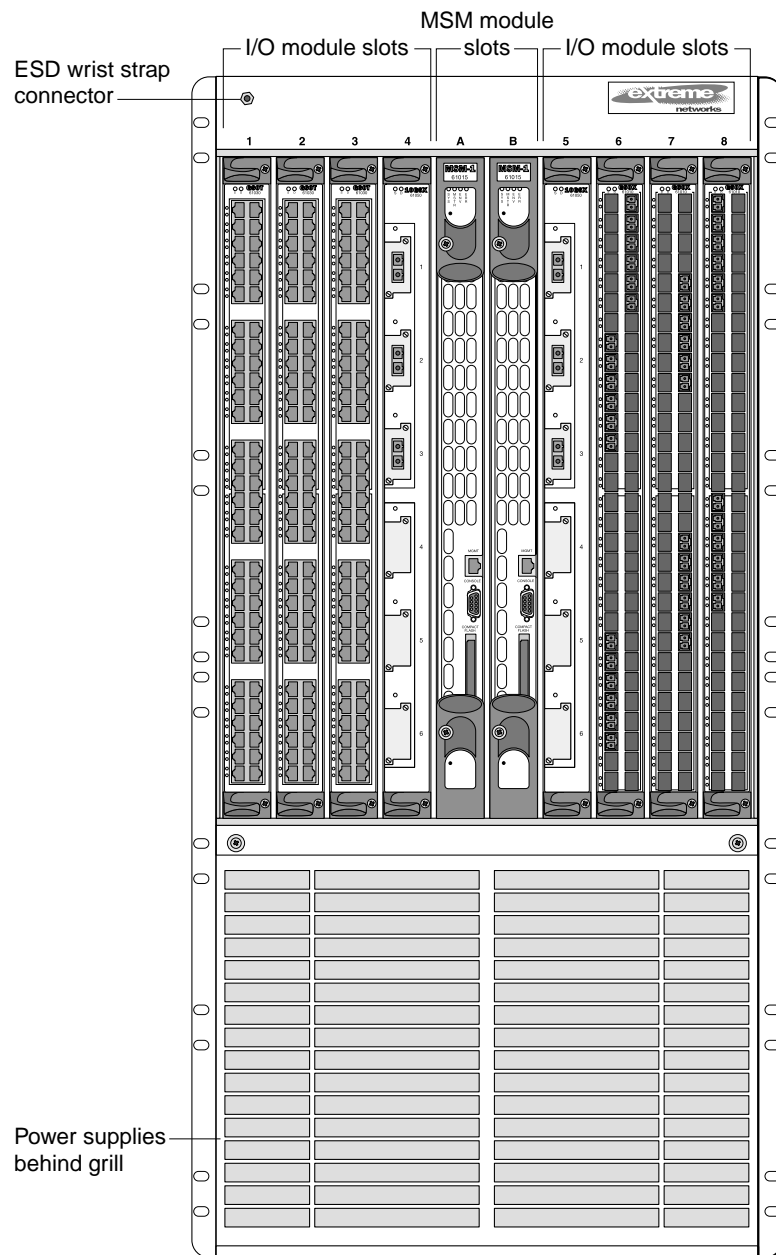
- One 10-slot chassis with backplane
- Eight I/O module slots, labeled 1 through 8
- Two MSM slots, labeled A and B
- Up to six power supplies (accessed from the front of the unit)
- Two fan trays (accessed from the back of the unit)
- One electromagnetic discharge (ESD) wrist strap connector

The BlackDiamond 10808 switch can support up to the following number of ports and types of port configurations:

- 32 switched Gigabit Ethernet ports
- 480 1000BASE-X ports
- 480 10/100/1000BASE-T ports

Figure 9 shows the BlackDiamond 10808 switch installed with two MSM-1 modules and eight optional I/O modules.

Figure 9: Front view of the BlackDiamond 10808 switch

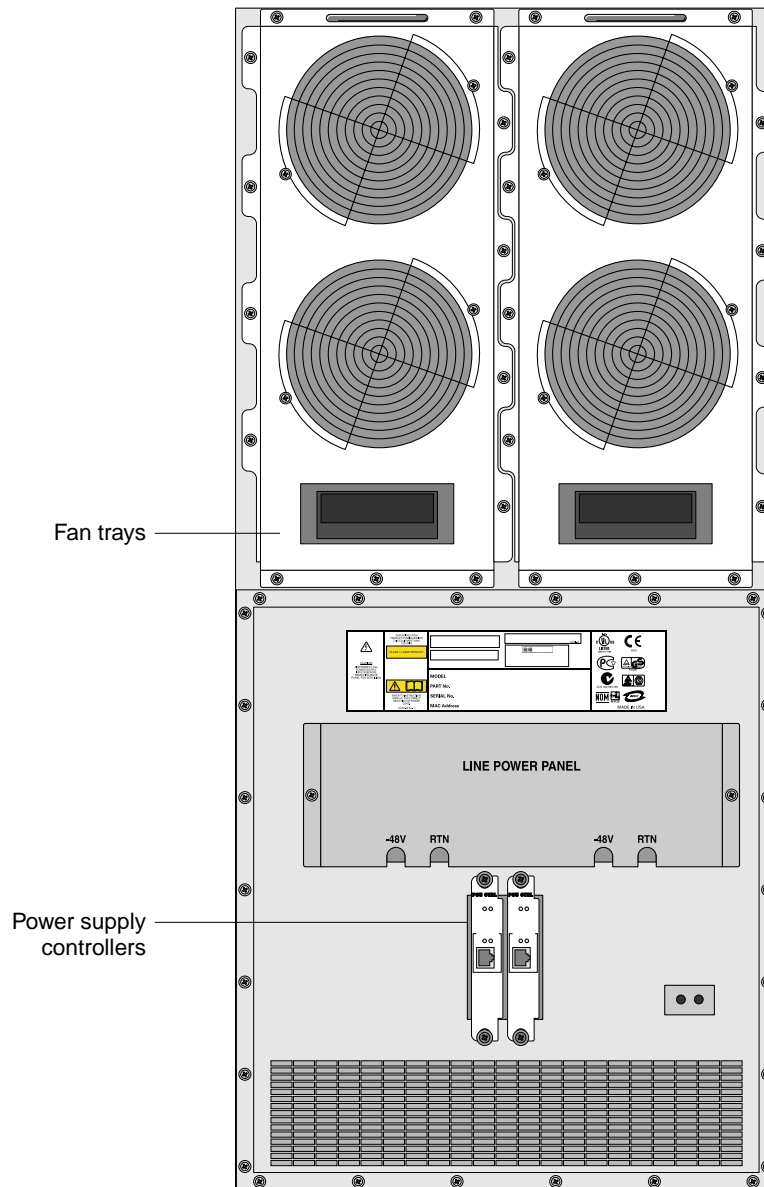


EX_001

BlackDiamond 10808 Switch Rear View

Figure 10 shows the rear view of the BlackDiamond 10808 switch.

Figure 10: Rear view of the BlackDiamond 10808 switch



EX_007

The rear view of the BlackDiamond 10808 switch provides:

- Access to the fan units
- The chassis serial number
- The Ethernet MAC address of the switch
- Symbols of safety certification
- Access to power supply controllers

BlackDiamond 10808 Switch LEDs

Table 9 describes the LED activity of the BlackDiamond 10808 switch.

Table 9: BlackDiamond 10808 switch LEDs

LED	Color	Indicates
DIAG	Green blinking	Power-on Self Test (POST) is running
	Off	Normal operation
STATUS	Green blinking	Normal operation
	Yellow blinking	Critical error, fan failure, or over temperature
	Off	Unit is not receiving power
EXTENDED MODE	Green	Extended mode operation
	Off	Not operating in extended mode
STANDARD MODE	Green	Standard mode operation
	Off	Not operating in standard mode

Power Socket

The BlackDiamond 10808 switch supports up to six AC power supplies. Each power supply has its own power socket. When additional power supplies are installed, they provide redundant, load-shared power to the BlackDiamond 10808 switch. If one of the power supplies fails, other power supplies provide all power and ensure uninterrupted network operation.

For more information about the power supplies, see Chapter 6.

Installing the Chassis

The BlackDiamond 10808 switch fits in standard 19-inch (48.26 cm) racks.

The BlackDiamond 10808 switch is shipped with a pre-installed fan tray. For your safety, due to the increased weight of the chassis after components are installed and to prevent damage to the equipment, Extreme Networks strongly recommends that you install the I/O modules after you mount the chassis in a rack.



NOTE

Mount the chassis in a rack before installing any switch components.

Rack Installation

To mount the BlackDiamond 10808 switch into a standard 19-inch (48.26 cm) rack, you need the following tools, equipment, and resources:

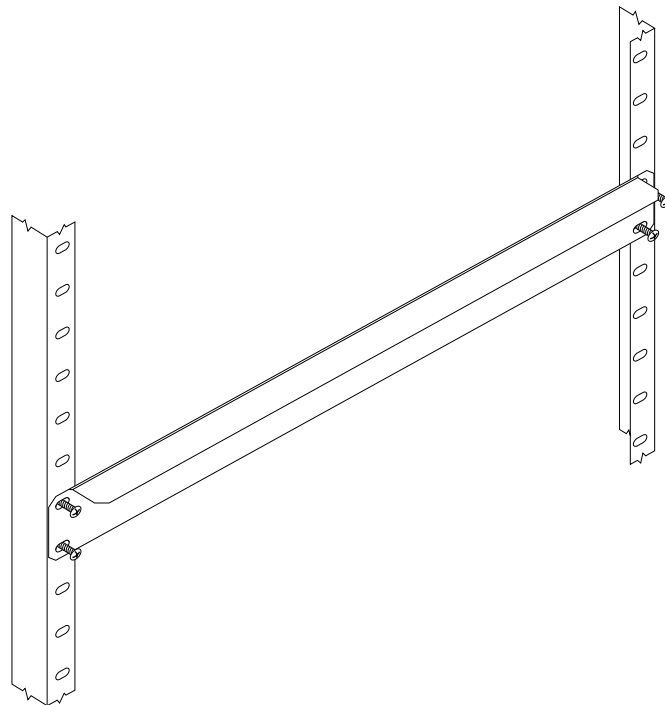
- Helper bracket (provided)
- A minimum of four appropriate screws to secure the helper bracket (not provided)

- # 1 Phillips screwdriver
- A minimum of two people to help install the chassis into the rack

To mount the chassis into a rack:

- 1 Mount the helper bracket in the lowest available position in the rack using four appropriate screws (not provided), as shown in Figure 11.

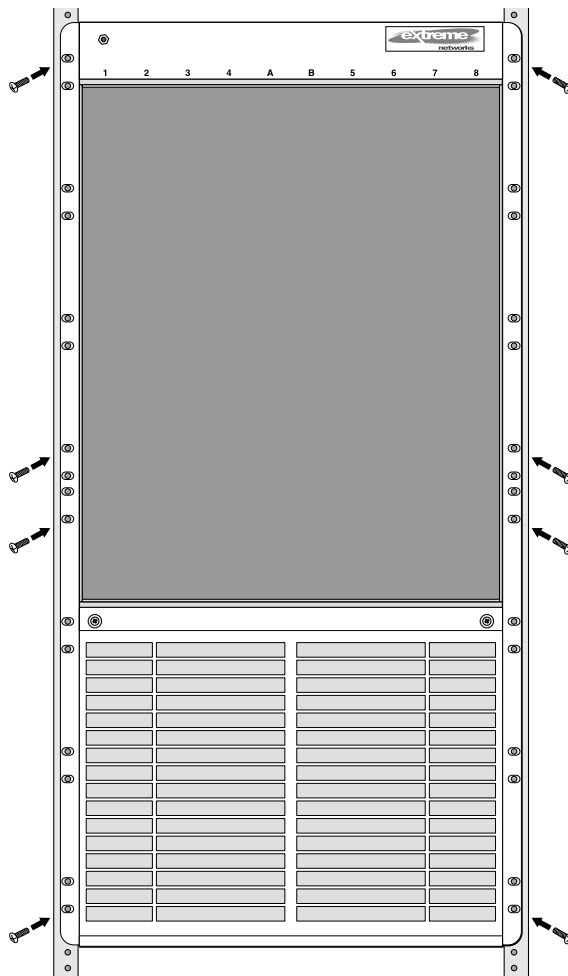
Figure 11: Helper bracket for mounting the BlackDiamond 10808 switch



BDbracket

- 2 Place the box that contains the chassis upright on a secure flat surface with the front of the box facing you.
- 3 Remove the chassis from the box, and remove the packing material from the chassis.
- 4 Have a minimum of two people lift and place the empty chassis on the helper bracket and slowly guide the chassis into the rack.
- 5 While holding the empty chassis, secure it with the screws.

Figure 12: The BlackDiamond 10808 chassis requires eight screws to be securely mounted in a rack



- 6** After you secure the chassis, remove the helper bracket. Store it for future use, for example, if you need to remove the chassis.

Grounding the BlackDiamond 10808 Switch

To ground your BlackDiamond 10808 switch in accordance with NEBS standards, gather these materials:

- Two zinc-plated steel lockwashers
- Two zinc-plated steel nuts
- One Panduit-style, standard two-hole barrel, copper compression lug
- 14 AWG, high strand-count copper wire cable

To ground the chassis:

- 1 Strip 0.5 inch (1.2 cm) of insulation from the 14 AWG, high strand-count copper wire cable.
- 2 Insert the cable into the cable lug.

**CAUTION**

Ensure that no copper is visible between the lug and the cable insulation.

- 3 Tighten the cable retention screw, using a $\frac{1}{4}$ " or $\frac{5}{16}$ " flathead screwdriver, to 20 in-lbs of torque.
- 4 Attach the ground lug, lock washers, and nuts (in that order) to the grounding studs on the rear of the chassis. Tighten the nuts to 125 in-lbs of torque.

4

BlackDiamond 10808 Switch Management Module

This chapter describes the BlackDiamond Management Switch Fabric Modules (MSM). The two MSMs are MSM-1 and MSM-1XL:

- Installing MSMs on page 48
- Removing MSMs on page 50

**NOTE**

Read the information in this chapter thoroughly before you attempt to install or remove the BlackDiamond Management Switch Fabric Module (MSM).

The MSM holds both the control plane and the switch fabric for the switch. One MSM is required for switch operation; however, adding an additional MSM increases reliability and throughput.

Each MSM has two CPUs for protocol processing and network management. For full redundancy, you can install up to two MSMs in the BlackDiamond 10808 switch.

The MSM-1 and MSM-1XL have different sized TCAM (Ternary Content Addressable Memory). TCAM is used for Longest Prefix Match routing lookups, learned MAC addresses, and ACLs. The MSM-1XL supports 256,000 entries in its lookup tables, while the MSM-1 supports 128,000 entries in its lookup table. One of these entries is used up per MAC learned, one per IP route, and two per ACL, and the lookup table space is dynamically allocated.

For example, if 20,000 ACLs are configured on an MSM-1, along with a routing table of 40,000 entries, then 48,000 entries would remain for MAC learning. $128,000 \text{ total entries} - 2 \times (20,000 \text{ ACLs}) - 1 \times (40,000 \text{ IP routes}) = 48,000$.

Table 10 shows that packet throughput between I/O modules increases when additional MSMs are installed.

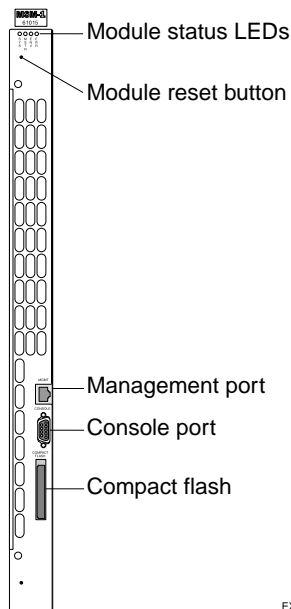
Table 10: Packet throughput between I/O modules

# of MSMs	Throughput
1	160 Gbps
2	320 Gbps

You can install the MSM in one of the designated (lettered) slots in the BlackDiamond 10808 switch chassis.

Figure 13 shows the front view of the MSM.

Figure 13: Management Switch Fabric Module (MSM)



The MSM consists of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in a BlackDiamond 10808 switch. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

The MSM has the following ports:

- Console port—Used to connect a terminal and perform local management.
- Management port—Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Modem port—Used to connect a modem for remote access to the CLI.
- Compact flash—Reserved for future use.

MSM Activity

The BlackDiamond 10808 switch can run with a single MSM installed. When you install additional MSMs, one of the MSMs operates as the *master*, and the others become the *slaves*.

The master MSM is responsible for upper-layer protocol processing and system management functions. For example, OSPF computation and SNMP functions are performed by the master MSM. Packet handling is distributed among the CPUs of all installed MSMs.

When you save the switch configuration, it is saved to all MSMs. If you download a new ExtremeWare image, the image is downloaded to all MSM.

Selection of the master MSM occurs automatically. The following scenarios describe the selection process:

- When the BlackDiamond 10808 switch boots with one or more MSMs already installed and an MSM is installed in slot A, the MSM in slot A becomes the master.
- When the BlackDiamond 10808 switch boots with a single MSM (regardless of the slot position), it is selected as the master.

If additional MSMs are added to the switch after it has been powered on, the added MSMs become the slaves. MSMs that operate as slaves can be inserted and removed without disrupting network services.

- If you remove the master MSM while the BlackDiamond 10808 switch is operating, the slave MSM experiences a soft reset and then becomes the master MSM.

For example, if you have a BlackDiamond 10808 switch with a master MSM in slot A and a slave MSM module in slot B, and you remove the master MSM from slot A, the slave in slot B becomes the master.

MSM LEDs

Table 11 describes the LED activity on the MSM.

Table 11: MSM LEDs

LED	Color	Indicates
SYS	Green blinking	Normal operation is occurring.
	Amber blinking	Diagnostic test is in progress.
	Amber	Diagnostic failure has occurred.
	Off	Switch is not receiving power.
MSTR	Green	Module is operating as master.
	Amber	Module is operating as slave.
ENV	Green	Environment (temperature, fan, power supply) is operating properly.
	Amber	Environmental failure has occurred.
ERR	Amber	A critical software error has been logged since power up.
	Off	Normal operation is occurring.
Link/Activity	Off	Link is down.
	Green	Link is up.
	Amber	Packet activity is occurring.



NOTE

To reset the critical software error LED (amber ERR LED), use the `clear log static` command and reboot the switch. If you continue to have critical software errors, or the ERR LED is amber after the `clear log static` command and a switch reboot, contact Extreme Networks Customer Support.

Installing MSMs

The BlackDiamond MSM is hot-swappable. You do not need to power off the system to insert an MSM.

You need the following tools and equipment to install an MSM:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver
- MSM module

To install the MSM:

- 1 Select a slot for the module:
 - Slot A or slot B in the BlackDiamond 10808 switch



CAUTION

You can install MSMs in lettered slots only. MSMs do not fit in numbered slots. Forceful insertion can damage the MSM.

- 2 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the switch front panel.
- 3 Remove the blank faceplate from the slot to make room for the module, if applicable.



NOTE

Any unoccupied module slot in the chassis should have a blank faceplate installed to ensure satisfactory protection from EMI and to guarantee adequate airflow through the chassis.

- 4 Place the ESD bag containing the MSM on a flat ESD surface, clean from any debris.
- 5 Break any seals on the bag.
- 6 Open the ESD bag and firmly grasp the rail of the module.
- 7 Holding the rail of the module, pull the ESD bag off the module.



NOTE

By holding the rail of the module and pulling the ESD module off the module, you will prevent damage to the module that might be caused by sliding the module on the ESD surface.

- 8 Check the connectors for dust and packing materials.



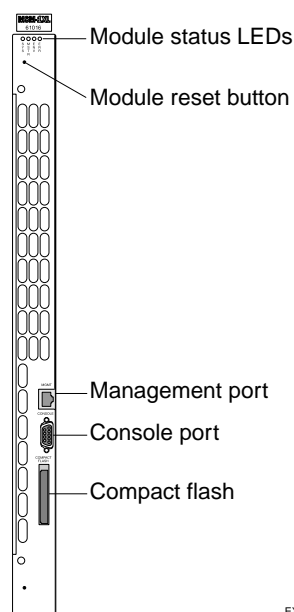
CAUTION

To prevent ESD damage, handle the module by the metal panel edges only. Never touch the components on the PCB or pins on any of the connectors.

9 Ensure that the MSM is vertical as shown in Figure 14, with the:

- Module name at the top
- PCB to the right
- Ejector/injector levers extended

Figure 14: MSM prior to insertion in a BlackDiamond 10808 switch



EX_016

- Slide the MSM into the appropriate lettered slot of the chassis, until it makes contact with the backplane.

NOTE

Use the metal panel, not the PCB, to guide the MSM.

As the MSM begins to seat in the chassis, the ejector/injector levers begin to close.

- To close the ejector/injector levers, use both hands simultaneously to push the handles toward the center of the module.
- To secure the module, tighten the two screws with a #1 Phillips screwdriver.

NOTE

Tighten the screws of this module before you insert additional modules. Otherwise, you might unseat modules that you have not secured.

- d If you install a slave MSM, use the `synchronize` command to replicate all saved images and configurations from the master MSM to the slave MSM.

You are not prompted to synchronize the images and the configurations from the master to the slave. If not synchronized, the slave uses its image and the master configuration. This image/configuration mismatch will likely cause the switch to operate differently after failover.



CAUTION

Depending on the size and complexity of your network, you should install and configure a slave MSM when network disruption will be minimal. You may need to reboot your switch after you use the `synchronize` command.

- 10 Store the module packaging for future use.
- 11 Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

To install additional MSMs, repeat steps 1 through 6.

Verifying the MSM Installation

After you install the MSM, verify that it is working correctly by checking the LEDs on the front panel of the MSM. If it is operating normally, the front-panel LED indicators appear as follows:

- SYS LED—Green blinking
- MSTR LED:
 - Green: Operating as master
 - Amber: Operating as slave
- ENV—Green
- ERR—Off
- Link/Activity:
 - Green: Link is up.
 - Amber: Packet activity is occurring.

For more information about MSM LED activity, see “MSM LEDs” on page 47.

Removing MSMs

The BlackDiamond MSM is hot-swappable. You do not need to power off the system to remove a module.

You need the following tools and equipment to remove an MSM:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver
- Replacement MSM

To remove an MSM:

- 1 Attach an ESD strap to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the switch front panel.
- 2 To loosen the module, unscrew the screws with a #1 Phillips screwdriver.
- 3 Simultaneously rotate the ejector/injector levers outward to disengage the module from the backplane.
 - a Grasp the module front panel with one hand, and place your other hand under the metal panel to support the weight of the module.

**CAUTION**

To prevent ESD damage, handle the module by the metal panel edges only. Never touch the components on the PCB or pins on any of the connectors.

- b Slide the module out of the chassis and place it immediately into an antistatic sack to protect it from ESD damage and to prevent dust from collecting on the module's connectors.
- 4 If you are going to install a replacement MSM, follow the installation procedure described on page 48.
- 5 Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

To remove additional MSMs, repeat steps 1 through 4.

5

BlackDiamond 10808 I/O Modules

This chapter describes:

- Configuring I/O Modules on page 53
- I/O Module LEDs on page 57
- Installing I/O Modules on page 58
- Verifying the I/O Module Installation on page 60
- Removing I/O Modules on page 61



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove any BlackDiamond I/O modules.

BlackDiamond I/O modules consist of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in a BlackDiamond 10808 switch. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

For more information about BlackDiamond I/O module specifications, see Appendix C, “Module Technical Specifications.”

Configuring I/O Modules

No configuration information is stored on the I/O modules; all configuration information is stored on the MSM(s).

When the BlackDiamond 10808 switch is powered on, ExtremeWare generates a default configuration for any slots that contain I/O modules. The default configuration allows the I/O module ports to participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the configuration to nonvolatile RAM (NVRAM).

You can configure parameters of the I/O module after it is installed or you can preconfigure a slot for a certain type of module and configuration. The preconfigured information is applied to the module after it is inserted. If you pre-configure a slot for a specific module type, and then insert a different type of module, the module reverts to its default configuration.

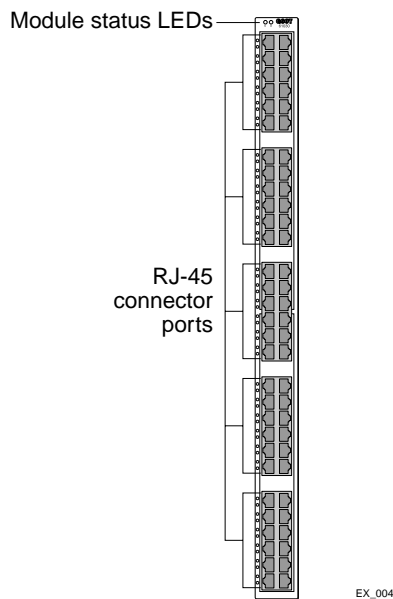
**NOTE**

See the ExtremeWare XOS Concepts Guide and the ExtremeWare XOS Command Reference Guide for more information about configuring I/O modules.

G60T Module

Figure 15 shows the G60T module.

Figure 15: G60T module



The G60T module has 60 autosensing 10/100/1000BASE-X ports that use standard RJ-45 connectors. If you have one MSM module installed, all ports on the G60T module are switched through that MSM module. If you have two MSM modules installed, the top 30 ports on the G60T module are switched through the MSM module in slot A, and the bottom 30 ports are switched through the MSM module in slot B during normal operation.

The default configuration of the G60T module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (protocol type, VLANid, and so forth)
- Operate in auto-negotiation mode

LEDs

The G60T module has the following LEDs:

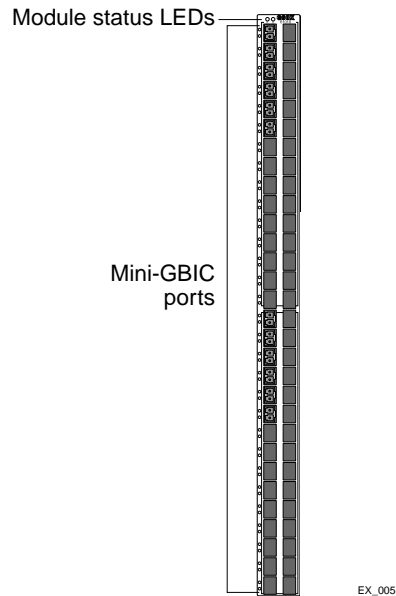
- Module status
- Port status
- Port speed

For information about the LEDs and their activity on the G60T module, see “I/O Module LEDs” on page 57.

G60X Module

Figure 16 shows the G60X module.

Figure 16: G60X module



The G60X module has 60 unpopulated Mini-GBIC-based Gigabit Ethernet fiber ports. If you have one MSM module installed, all ports on the G60X module are switched through that MSM module. If you have two MSM modules installed, the top 30 ports on the G60X module are switched through the MSM module in slot A, and the bottom 30 ports are switched through the MSM module in slot B during normal operation.

All Gigabit Ethernet ports on these modules use SPF fiber Mini-GBIC connectors and support 1000BASE-SX, 1000BASE-LX, 1000BASE-LX70, and 1000BASE-ZX.

The default configuration of the G60X module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (protocol type, VLANid, and so forth)

Mini-GBIC Ports

The G60X module supports any of the following Mini-GBICs:

- SX mini-GBIC, which conforms to the 1000BASE-SX standard
- LX mini-GBIC, which conforms to the 1000BASE-LX standard
- ZX mini-GBIC, which conforms to the IEEE 802.3z standard

Table 12 describes the media types and the associated maximum distances for the GM-16X3 module.

Table 12: G60X media types and distances

Mini-GBIC Type	Media Type	Maximum Distance (meters)
1000BASE-SX	multimode fiber	550
1000BASE-LX	single-mode fiber	10,000
1000BASE-ZX	single-mode fiber	70,000



NOTE

For more information about the supported Mini-GBIC types and specifications, see “Mini-GBIC Type and Hardware/Software Support” on page 12.

LEDs

The G60X module has the following LEDs:

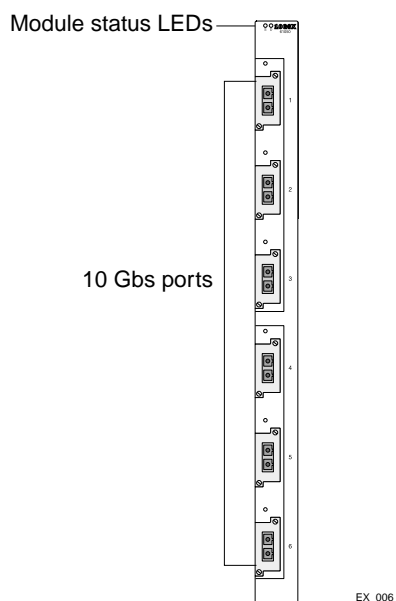
- Module status
- Port status

For information about the LEDs and their activity on the G60X module, see “I/O Module LEDs” on page 57.

10G6X Module

Figure 17 shows the 10G6X module.

Figure 17: 10G6X module



The 10G6X module has six unpopulated XENPAK-based 10 Gigabit Ethernet ports.

If you have one MSM module installed, all ports on the 10G6X module are switched through that MSM module. If you have two MSM modules installed, the top 3 ports on the 10G6X module are switched through the MSM module in slot A, and the bottom 3 ports are switched through the MSM module in slot B during normal operation.

The default configuration of the 10G6X module is as follows.

All ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (protocol type, VLANid, and so forth).

If you have one MSM module installed, all ports are switched through that MSM module. If you have two MSM modules installed, the top three ports on the 10G6X module are switched through the MSM module in slot A, and the bottom three ports are switched through the MSM module in slot B during normal operation.

LEDs

The 10G6X module has the following LEDs:

- Module status
- Port status

For information about the LEDs and their activity on the 10G6X module, see “I/O Module LEDs” on page 57.

I/O Module LEDs

Table 13 describes the LED activity on the BlackDiamond I/O modules.

Table 13: BlackDiamond Ethernet I/O module LEDs

LED	Color	Indicates
Status	Green blinking	Normal operation
	Amber blinking	Configuration error, code version error, diagnostic failure, or other severe module error
	Off	No power
DIAG	Off	Normal operation
	Amber blinking	Diagnostics in progress
	Amber	Diagnostic failure
Port x	Green	Link up
	Green blinking	Link down
	Amber blinking	Packet activity
	Off	Link down

Installing I/O Modules

You can insert I/O modules at any time, without causing disruption of network services. Complete the action of inserting a BlackDiamond I/O module in a reasonable time frame. Be sure to insert the module completely to avoid partial connection of backplane connectors.

You need the following tools and equipment to install an I/O module:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver
- I/O module
- Appropriate type of cable for the I/O module you plan to install

To install an I/O module:

- 1 Select a slot for the module. Slots are numbered 1 through 8 in the BlackDiamond 10808 chassis.
- 2 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the switch front panel.
- 3 Remove the blank faceplate from the slot to make room for the module, if applicable.

NOTE

Any unoccupied module slot in the chassis should have a blank faceplate installed to ensure satisfactory protection from EMI and to guarantee adequate airflow through the chassis.

- 4 Place the ESD bag containing the I/O module on a flat ESD surface, clean from any debris.
- 5 Break any seals on the bag.
- 6 Open the ESD bag and firmly grasp the rail of the module.
- 7 Holding the rail of the module, pull the ESD bag off the module.

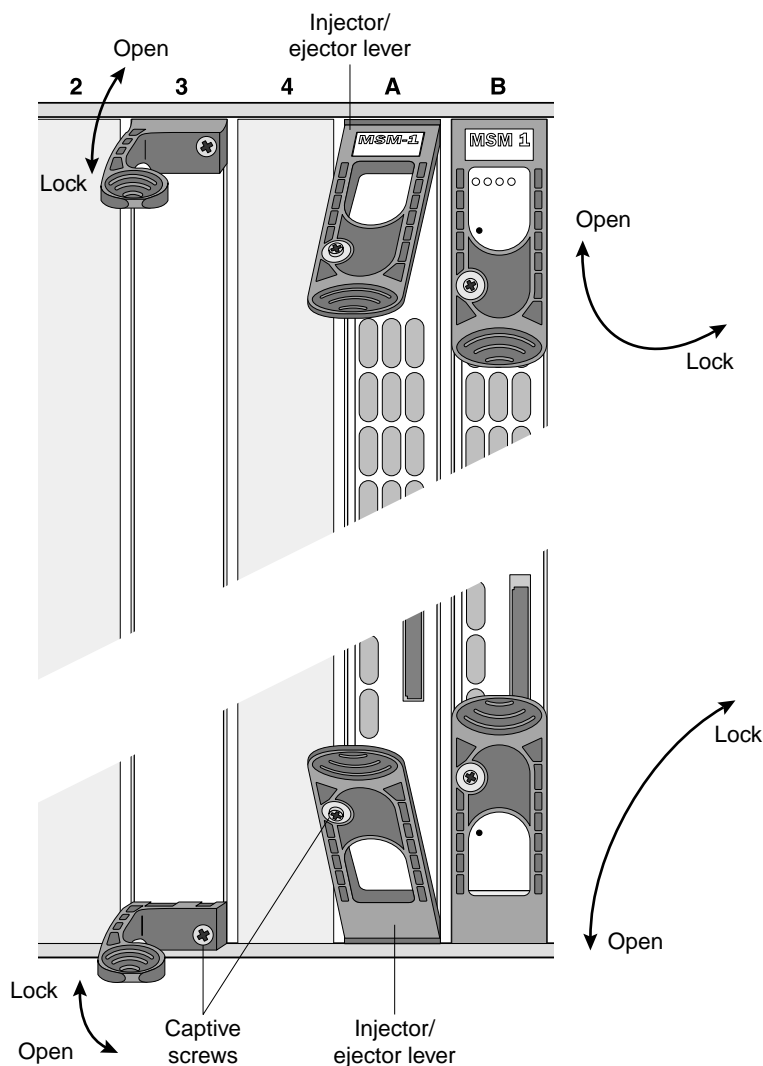
NOTE

By holding the rail of the module and pulling the ESD module off the module, you will prevent damage to the module that might be caused by sliding the module on the ESD surface.

CAUTION

To prevent ESD damage, handle the module by the metal panel edges only. Never touch the components on the PCB or pins on any of the connectors.

- 8 Ensure that the module is vertical with the module name at the top, the PCB to the right, and that the ejector/injector levers are extended.



EX_017

- a Slide the module into the appropriate slot of the chassis until it makes contact with the backplane.

**NOTE**

Use the metal panel, not the PCB, to guide the I/O module

As the module begins to seat in the chassis, the ejector/injector levers begin to close.

- b To close the ejector/injector levers, use both hands simultaneously to push the levers toward the center of the module.
- c To secure the module, tighten the two captive screws using a #1 Phillips screwdriver.

**NOTE**

Tighten the screws of this module before inserting additional modules. Otherwise, you might unseat modules that you have not secured.

- 9 Store the module packaging for future use.
- 10 Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

To install additional I/O modules, repeat steps 1 through 6.

Verifying the I/O Module Installation

After you install an I/O module, verify that it is working correctly. Check the LEDs on the front panel of the I/O module and use the command-line interface (CLI) `show slot <slot number>` command to display slot-specific information about the newly installed module.

LED Indicators

When the I/O module and its ports (if applicable) are configured and operating normally, the front-panel LED indicators should appear as follows:

- STATUS LED—green blinking
- DIAG LED—off
- Port status LED (per port):
 - The ARM and MPLS modules do not have external network interfaces (ports); therefore, there are no port status LEDs on those modules.
 - Green
 - Amber blinking (all except ATM and PoS modules)
 - Amber blinking, returning to green (ATM and PoS modules only)

For more information about I/O module LED activity, see “I/O Module LEDs” on page 57.

Displaying Slot Status Information

Assuming the I/O module has no problems, the command `show slot <slot>` (where *<slot>* is the number of the slot where you installed the module) displays information about the module including: general information about the module (name, serial number, part number), the state of the module (power down, operational, mismatch between the slot configuration and the module in the slot), and the status of the ports on the module.

For more information about slot status information, see the *ExtremeWare Software User Guide* and the *ExtremeWare Command Reference Guide*.

Removing I/O Modules

All BlackDiamond I/O modules are hot-swappable. You do not need to power off the system to remove a module. Complete the action of removing a BlackDiamond I/O module in a reasonable time frame. Be sure to remove the module completely to avoid partial connection of backplane connectors.



NOTE

If you remove a BlackDiamond I/O module during traffic flow to the module, several error messages might be written to the log immediately. These messages should cease to occur after 10 seconds. Under this circumstance, the error messages can be safely ignored. The error messages might contain one or more of the following:

```
04/13/1999 17:18.46 <DEBUG:KERN> killPacket: HW pgmWaitRx failed
04/13/1999 17:18.46 <DEBUG:KERN> pgmWaitKill failed. Card 1 is removed
```

You need the following tools and equipment to remove an I/O module:

- ESD-preventive wrist strap
- #1 Phillips screwdriver
- Replacement I/O module or blank faceplate if you are not replacing the I/O module

To remove an I/O module:

- 1 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the switch front panel.
- 2 Use a #1 Phillips screwdriver to unscrew the two captive screws.
- 3 Simultaneously rotate the ejector/injector levers outward to disengage the module from the backplane.
 - a Grasp the module front panel with one hand, and place your other hand under the metal panel to support the weight of the module.



CAUTION

To prevent ESD damage, handle the module by the metal panel edges only. Never touch the components on the PCB or pins on any of the connectors.

- b Slide the module out of the chassis and place it immediately into an antistatic sack to protect it from ESD damage and to prevent dust from collecting on the module's connectors.
- 4 If you are not going to install a replacement I/O module, cover the slot with a blank faceplate. Otherwise, follow the I/O module installation procedure on page 58.
- 5 Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

To remove additional I/O modules, repeat steps 1 through 4.

6

BlackDiamond 10808 Switch Power Supplies and Power Supply Controllers

The BlackDiamond 10808 chassis accommodates up to six hot-swappable power supplies. Power supply controllers are included to:

- Monitor power supply status
- Control power supply operation
- Access operational data by communicating with the MSM modules through an RJ-45 interface

This chapter describes:

- Power Supply Overview on page 64
- Installing the Power Supplies on page 67
- Removing the Power Supplies on page 68
- Power Supply Controller Overview on page 69
- Installing the Power Supply Controllers on page 70
- Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components. on page 68

NOTE

Read the information in this chapter thoroughly before you attempt to install, remove, or supply power to any power supply.

CAUTION

Service to BlackDiamond 10808 AC power supplies should be performed by trained service personnel only. Before installing or removing any components of the system, or before carrying out any maintenance procedures, read the safety information provided in Appendix A of the Extreme Networks Consolidated Hardware Guide.

Power Supply Overview

The AC power supplies are fully fault tolerant and load-sharing. If one power supply fails, the other power supplies will provide sufficient power to operate a fully loaded chassis. Table 14 lists the specifications for the power supply.

Table 14: BlackDiamond AC power supply specifications

Characteristic	Specification
AC power supply input socket	IEC part number 320 C14
Input power	100-120 AC, 10 A max. 200-240 AC, 9 A max.
Output power	700 W / 1200 W
AC line frequency	50 Hz to 60 Hz

Table 15: Power draw

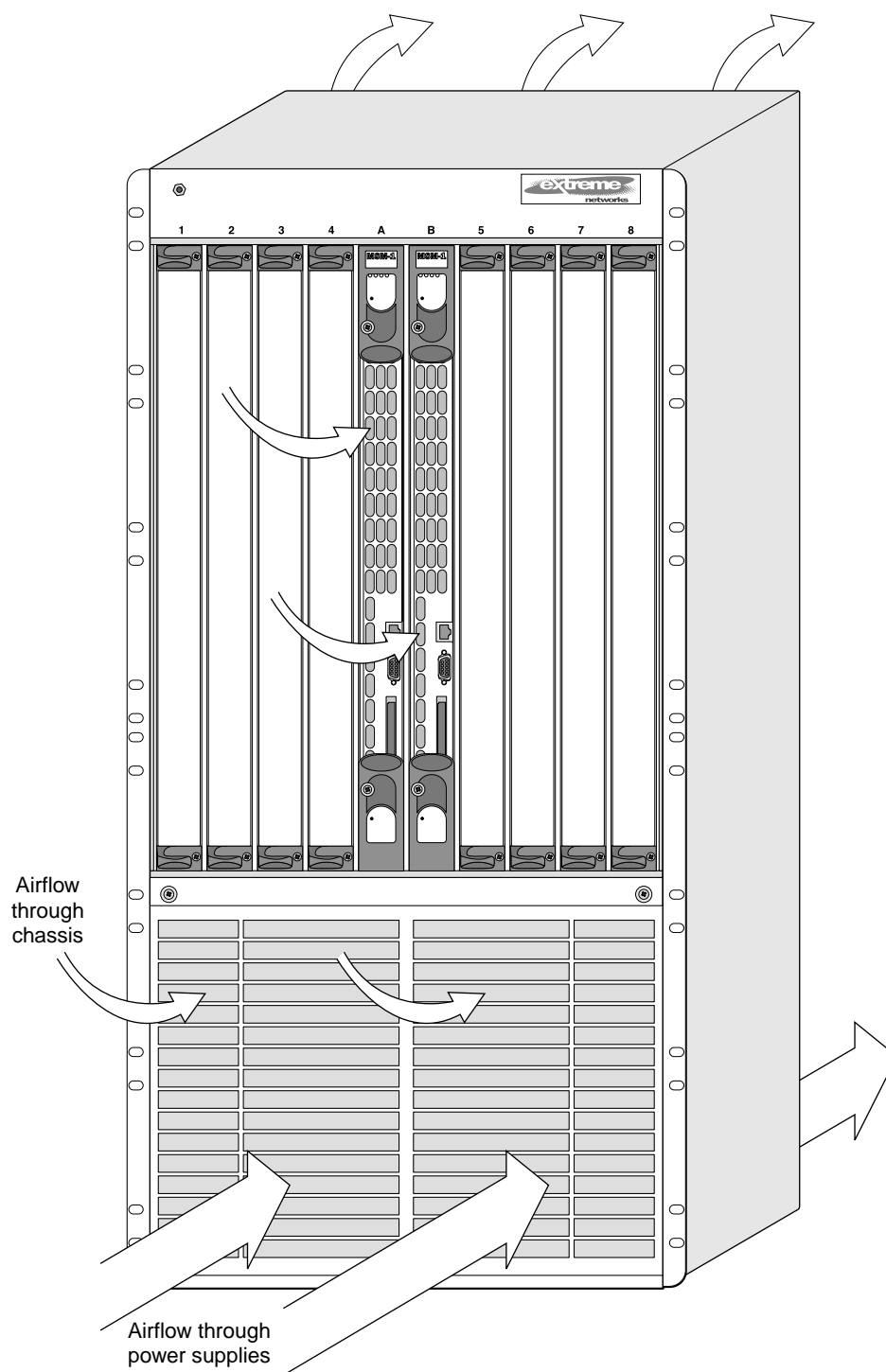
Part	Power required
Chassis with Fan Tray	250W
MSM-1/MSM-1XL	444W
G60X	223W
G60T	220W
10G6X	230W

Each power supply has two DC outputs (12V Standby and 48V) that connect to the chassis backplane. The 12V Standby is used only to power the system logic circuitry. The 48V is used to power all the system blades and the fan trays.

Since the power supply can provide higher output power at high line, use of 200 - 240VAC input is recommended. If low line is used to power the chassis, more power supplies will be needed to support the load. The software will determine the maximum available power required for the chassis and will enable the blades accordingly. You must power the entire chassis from one type of AC input line only. If low line is used to power one or more of the power supplies, all power supplies in that chassis will be limited to low power level only to support redundancy.

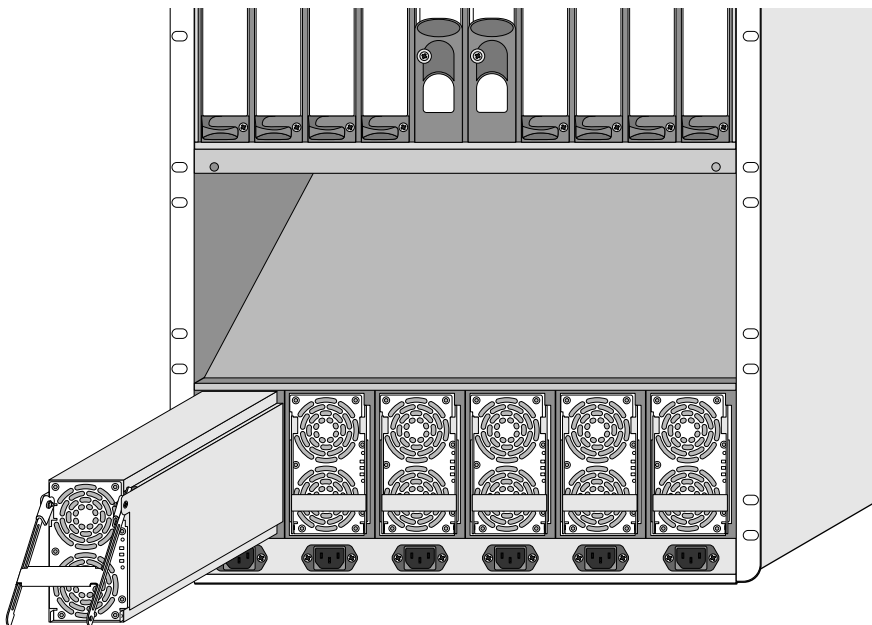
Each BlackDiamond 10808 chassis power supply contains two cooling fans. Air enters from the front vents on the power supply and exits from the rear vents of the chassis. This airflow is independent of the airflow through the rest of the chassis.

Figure 18 displays an example of how the air flows through the power supplies in a BlackDiamond 10808 chassis.

Figure 18: Airflow through the BlackDiamond 10808 chassis

EX_010

Power supplies slide in from the front of the chassis, as illustrated in Figure 19.

Figure 19: Sliding the power supply into the power bay

EX_011

The AC input is located on the front of the BlackDiamond 10808 switch directly under each power supply bay. The front of the power supply has a handle with a cam lever mechanism for both insertion and removal of the power supply. The front panel also provides status LEDs. Table 16 describes the LED behavior on the AC power supplies.

Table 16: AC power supply LEDs

LED	Color	Indicates
Power (PWR)	Blinking Green	Power is present and standby output is on.
	Solid Green	AC power is present and power supply is operating normally.
	Off	There is no power present.
Predictive Failure	Blinking Amber	A fan has slowed down and is about to fail.
	Off	The fans and power supply are operating normally.
Fail	Blinking Amber	There is a current limit on 48 VCD output.
	Solid Amber	The power supply has failed, or there is no AC power to this power supply.
	Off	The power supply is operating normally.

Installing the Power Supplies

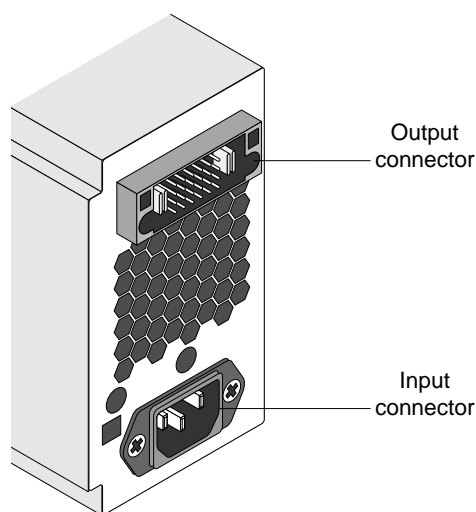
You need the following tools and equipment to install the BlackDiamond 10808 AC power supply:

- ESD-preventive wrist strap
- AC power supply

To install a power supply:

- 1 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the BlackDiamond chassis front panel.
- 2 If a blank faceplate is covering the power supply bay, remove it and save it for future use.
- 3 Ensure that the power supply is right side up and the locking handle is open.

Figure 20: Input and output connectors on back of power supply



EX_014

- 4 Gently begin to slide the power supply into the power supply bay.

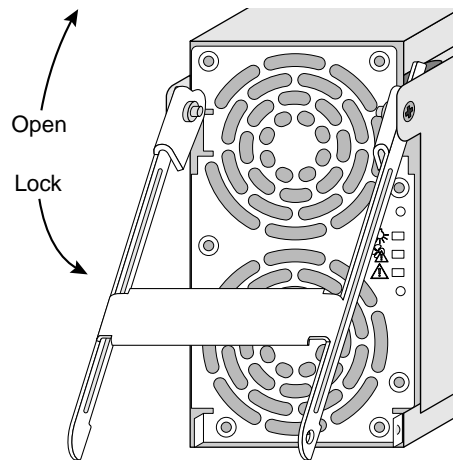


CAUTION

Do not slam the power supply into the backplane. Use the locking handle to secure the power supply unit into the chassis.

- 5 Secure the power supply in a BlackDiamond 10808 switch by pushing down on the locking handle until it clicks in place.

Figure 21: Locking handle on power supply



EX_015

- 6** To turn on power to the system, connect the power cables to the AC input on the front of the BlackDiamond chassis and then to the wall outlet.
- 7** Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

To install additional power supplies, repeat steps 1 through 7.

Removing the Power Supplies

You need the following tools and equipment to remove the BlackDiamond 10808 AC power supplies:

- ESD-preventive wrist strap
- Replacement AC power supply

To remove a power supply:

- 1** Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the BlackDiamond front panel.
- 2** Completely remove the power supply cord from the wall outlet and then from the AC input on the front of the chassis.
- 3** Disengage the power supply by lifting the handle up.
- 4** Slowly slide the power supply out of the chassis by grasping the edges of the power supply with both hands and pulling the power supply towards you. After you pull the power supply towards you, place both hands underneath the power supply to support it as you pull it out of the chassis.
- 5** Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

Power Supply Controller Overview

The BlackDiamond 10808 switch includes two power supply controllers, located in the back of the chassis, that collect data from the installed power supplies and report the results to the MSM modules via an I²C interface.

When the BlackDiamond 10808 switch is first powered on, the power supply controllers enable the power supplies by providing 48V power. The power supply controller also detects and reports incompatible combinations of power supply types and line voltage feeds, and disables the power supply if an unsafe condition arises.

Two power supply controllers installed in the BlackDiamond 10808 switch provide master/slave redundancy in the case that one of the controllers fails or is removed. At least one power supply controller must be installed.

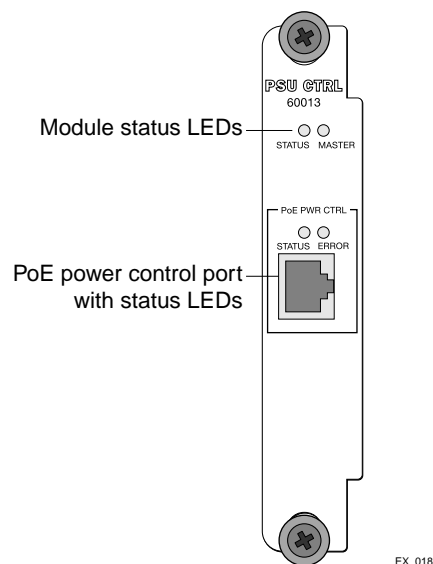


CAUTION

Do not reach into the power supply controller access area when power is on.

Figure 22 shows the front panel of the power supply controller.

Figure 22: Power supply controller front panel



NOTE

The RJ-45 port on the power supply controller should not be used as an Ethernet port.

The front panel of the power supply controllers provide status LEDs. Table 17 describes the LED behavior on the power supply controllers.

Table 17: Power supply controller LEDs

LED	Color	Indicates
STATUS	Amber	Diagnostics in progress.
	Green	Normal operation.
MASTER	Blinking Green	Unit is master.
	Off	Unit is slave.
PoE PWR CTRL STATUS	Green	Link idle.
	Amber	Link busy.
PoE PWR CTRL ERROR	Off	No errors detected.
	Amber	Errors detected.

Installing the Power Supply Controllers

To install a power supply controller:

- 1 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the BlackDiamond chassis front panel.
- 2 If a blank faceplate is covering the power supply controller bay, remove it and save it for future use.
- 3 Ensure that the power supply controller is right side up.
- 4 Slide the power supply controller into the slot, aligning the notch on the top of the slot with the power supply controller.
- 5 Use the thumbscrews and a #2 Phillips screwdriver to secure the power supply controller into the slot.

Verifying a Successful Installation

After you supply power to the switch, the switch performs a power-on self test (POST).

During the POST:

- All ports are temporarily disabled.
- The packet LED is off.
- The power LED is on.
- The MGMT LED flashes until the switch successfully passes the POST.

If the switch passes the POST, the MGMT LED blinks at a slow rate (one blink per second). If the switch fails the POST, the MGMT LED shows a solid yellow light.



BlackDiamond 10808 Switch Fan Tray

This chapter describes:

- BlackDiamond 10808 Switch Fan Tray on page 71
- Removing the BlackDiamond 10808 switch Fan Tray on page 72
- Installing the Fan Tray on page 73



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove any BlackDiamond fan tray.

BlackDiamond 10808 Switch Fan Tray

The BlackDiamond 10808 switch fan tray:

- Contains two individual fans
- Is preinstalled at the factory
- Is hot-swappable, which means you can remove and replace the fan tray without powering down the switch
- Can be removed and installed by customers



CAUTION

Do not cover or obstruct the fan ventilation holes at the rear of the unit. Doing so can result in overheating and possible damage to the BlackDiamond 10808 switch. Thermal sensors will shut down the BlackDiamond 10808 switch if the internal temperature exceeds 60 degrees Celsius.



NOTE

In the event of a fan tray failure, please contact Extreme Networks.

ExtremeWare monitors the fan trays in the BlackDiamond 10808 switch for overheat conditions. All over temperature events cause the switch to send alerts to the network management station or to the switch log. See the *ExtremeWare XOS Concepts Guide* for more information about switch monitoring.

Removing the BlackDiamond 10808 Switch Fan Tray

BlackDiamond 10808 switch fan trays are hot-swappable. You do not need to turn off power to an BlackDiamond 10808 switch to remove a fan tray.

You need the following tools and equipment to remove a fan tray:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver



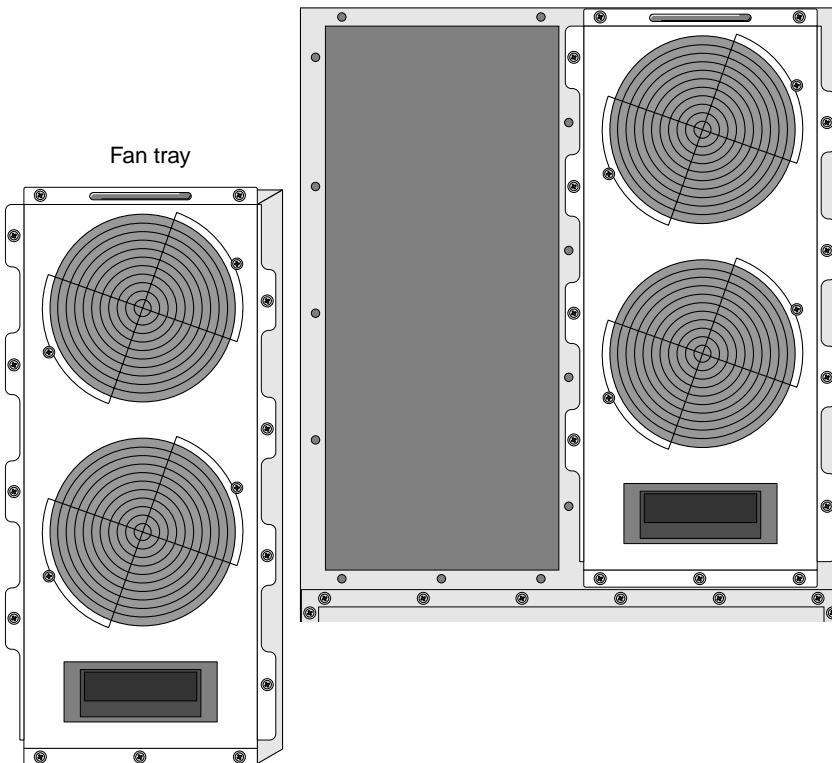
CAUTION

Only trained service personnel should perform service to BlackDiamond 10808 switch fan trays. Before installing or removing any components, or carrying out any maintenance procedures, see Appendix A.

To remove the fan tray from the BlackDiamond 10808 switch:

- 1 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-right corner of the switch front panel.
- 2 Unscrew the two captive screws that secure the fan tray to the chassis by turning them counterclockwise (to the left).
- 3 Use the finger grips to pull the fan tray out of the chassis approximately 1 inch (2.54 cm), as shown in Figure 22; this step disconnects the power and causes the fans to stop rotating.

Figure 23: BlackDiamond 10808 fan tray



EX_012

- 4 Allow the fan blades to stop spinning before you remove the fan tray from its slot.

**WARNING!**

Keep your hands away from rotating fan blades.

- 5 To support the fan tray, place one hand under the fan tray and use the other hand to pull the fan tray from its slot.
- 6 Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

Installing the Fan Tray

The BlackDiamond 10808 switch fan trays are hot-swappable. You do not need to turn off power to an BlackDiamond 10808 switch to install a fan tray.

You need the following tools and equipment to install a fan tray:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver
- Replacement fan tray

**CAUTION**

Only trained service personnel should perform service to BlackDiamond 10808 switch fan trays. Before installing or removing any components, and before carrying out any maintenance procedures, see Appendix A.

To install the fan tray in the BlackDiamond 10808 switch:

- 1 Attach the ESD strap that is provided to your wrist and connect the metal end to the ground receptacle that is located on the top-right corner of the switch front panel.
- 2 Check the connectors for dust and packing materials.
- 3 To support the fan tray, place one hand under the fan tray and use the other hand to guide the fan tray into the slot.

Gently begin to insert the new fan tray into the slot.

**NOTE**

If the chassis is powered on, the fan blades will begin turning as soon as the tray makes contact with the backplane.

- 4 To secure the fan tray, turn the screws clockwise until they become tight.
- 5 Leave the ESD strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.



8 Initial Switch and Management Access

This chapter describes:

- Connecting Equipment to the Console Port on page 75
- Logging In for the First Time on page 77

Connecting Equipment to the Console Port

Connection to the console port is used for direct local management. The console port settings are:

- **Baud rate**—9600
- **Data bits**—8
- **Stop bit**—1
- **Parity**—None
- **Flow control**—XON/XOFF

The terminal or PC with terminal-emulation software that you connect to the BlackDiamond switch must be configured with these settings. This procedure is described in the documentation supplied with the terminal.

Appropriate cables are available from your local supplier, or you can make your own. To ensure the electromagnetic compatibility of the unit, only shielded serial cables should be used. Table 18 describes the pinouts for a DB-9 male console connector.

Table 18: Pinouts for the console connector

Function	Pin Number	Direction
DCD (data carrier detect)	1	In
RXD (receive data)	2	In
TXD (transmit data)	3	Out
DTR (data terminal ready)	4	Out
GND (ground)	5	-
DSR (data set ready)	6	In
RTS (request to send)	7	Out

Table 18: Pinouts for the console connector (continued)

Function	Pin Number	Direction
CTS (clear to send)	8	In

Figure 24 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.

Figure 24: Null-modem cable pinouts

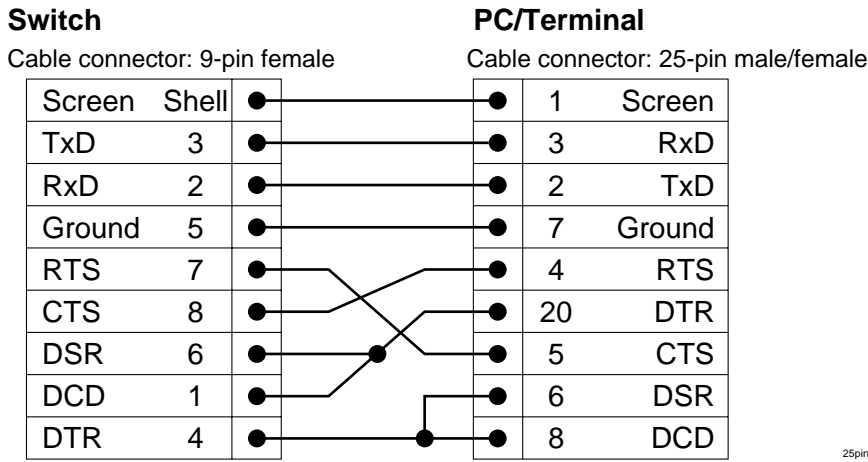
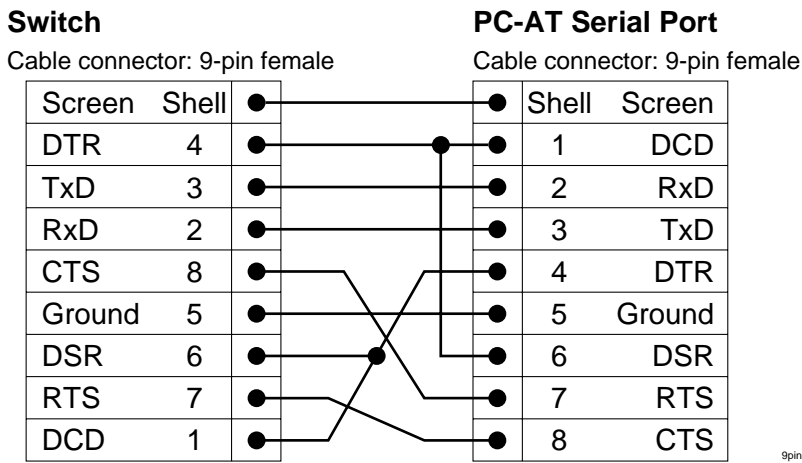


Figure 25 shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.

Figure 25: PC-AT serial null-modem cable pinouts



Logging In for the First Time

After your switch has completed all POSTs, it is operational. When the switch is operational, you can log in and configure an IP address for the default VLAN (named *default*).

To manually configure the IP settings:

- 1 Connect a terminal or PC with terminal-emulation software to the MSM.
- 2 At your terminal, press [Return] one or more times until you see the login prompt.
- 3 At the login prompt, enter the default user name `admin` to log on with administrator privileges. For example:

```
login: admin
```

Administrator capabilities allow you to access all switch functions.



For more information about logging in to the switch and configuring switch management access, see the Extreme Networks XOS Concepts Guide.

- 4 At the password prompt, press [Return].

This is because the default user name, `admin`, has no password assigned to it. When you have successfully logged on to the system, the command-line prompt displays the system name (for example, `BlackDiamond10808>` in its prompt).



For more information about how to make a specific system name, see the ExtremeWare Software User Guide.

- 5 Assign an IP address and subnetwork mask for VLAN *default* by typing:

```
config vlan default ipaddress 123.45.67.8 255.255.255.0
```

Your changes take effect immediately.

- 6 Save your configuration changes so that they will be in effect after the next system reboot by typing:
save

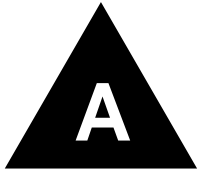
The configuration is saved to the configuration database of the SMMi modules in the BlackDiamond 10808 switch and both MSM160 modules in the BlackDiamond switch.



For more information about saving configuration changes, see the Extreme Networks XOS Concepts Guide.

- 7 When you are finished with these tasks, log out of the switch by typing:

```
logout
```

Safety Information

Important Safety Information



WARNING!

Read the following safety information thoroughly before installing your Extreme Networks switch. Failure to follow this safety information can lead to personal injury or damage to the equipment.

Installation, maintenance, and removal of a switch, chassis, or its components must be done by qualified service personnel only.

Qualified service personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves or other people.

You should consider the following before unpacking your equipment:

- Install the equipment in a secured, enclosed, and restricted-access area, ensuring that only qualified service personnel have access to the equipment.
- Install the equipment only in a temperature- and humidity-controlled indoor area that is free of airborne materials that can conduct electricity. Too much humidity can cause a fire. Too little humidity can produce electrical shock and fire.
- When you handle the equipment on modular switches, put on the ESD wrist strap to reduce the risk of electronic damage to the equipment. Leave the ESD strap permanently attached to the chassis so that it is always available when you need to handle ESD-sensitive components.

Power

The BlackDiamond 10808 switch has eight 110/220 VAC power inputs.

- Disconnect power before removing the back panel of the switch.
- The unit must be grounded. Do not connect the power supply unit to an AC outlet without a ground connection.
- The unit must be connected to a grounded outlet to comply with European safety standards.
- The socket outlet must be near the unit and easily accessible. You can only remove power from the unit by disconnecting the power cable from the outlet.

- This unit operates under Safety Extra Low Voltage (SELV) conditions according to the IEC 950 standard. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.
- The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN60320/IEC320 appliance inlet.
- *France and Peru only*
This unit cannot be powered from IT[†] supplies. If your supplies are of IT type, this unit must be powered by 230 V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labeled Neutral and connected directly to ground.

Power Cable

Use an AC power cable appropriate for your country. Check your local electrical codes and regulatory agencies for power cable requirements. The countries listed below have the following additional requirements:

- USA and Canada
 - The cable set must be UL-listed and CSA-certified.
 - The minimum specification for the flexible cable is No. 18 AWG (1.5 mm²), Type SVT or SJT, 3-conductor.
 - The cable set must have a rated current capacity of at least the amount rated for each specific product.
 - The AC attachment plug must be an Earth-grounding type with a NEMA 5-15P (10 A, 125 V) configuration.
- Denmark
 - The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
- Switzerland
 - The supply plug must comply with SEV/ASE 1011.
- Argentina
 - The supply plug must comply with Argentinian standards.



NOTE

When using dual power supplies, make sure that each AC power supply attaches to an independent power source.

Connections

Fiber Optic ports - Optical Safety. To protect your eyes, never look at the transmit LED/laser through a magnifying device while it is powered on. Never look directly at a fiber port on the switch or at the ends of fiber cable when they are powered on.

This is a Class 1 laser device.



WARNING!

Use fiber optic ports only for data communications applications that require optical fiber. Use only with the appropriate connector. When not in use, replace dust cover. Using this module in ways other than those described in this manual can result in intense heat that can cause fire, property damage, or personal injury.

Lithium Battery

The battery in the bq4830/DS1644 device is encapsulated and not user-replaceable. The battery is located on the MSM motherboard for the BlackDiamond switch.

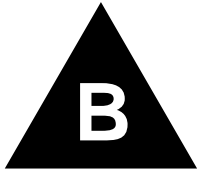
If service personnel disregard the instructions and attempt to replace the bq4830/DS1644, replace the lithium battery with the same or equivalent type, as recommended by the manufacturer.



WARNING!

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

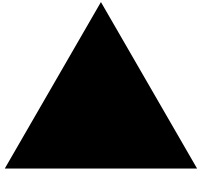
- Disposal requirements vary by country and by state.
- Lithium batteries are not listed by the Environmental Protection Agency (EPA) as a hazardous waste. Therefore, they can typically be disposed of as normal waste.
- If you are disposing of large quantities, contact a local waste-management service.
- No hazardous compounds are used within the battery module.
- The weight of the lithium contained in each coin cell is approximately 0.035 grams.
- Two types of batteries are used interchangeably:
 - CR chemistry uses manganese dioxide as the cathode material.
 - BR chemistry uses poly-carbonmonofluoride as the cathode material.



Switch Technical Specifications

Table 19: BlackDiamond 10808 switch specifications

Physical Dimensions	
	Height: 38.5 inches (97.8 cm) Width: 17.3 inches (43.9 cm) Depth: 21.0 inches (53.3 cm)
Safety	
Certifications and Standards	UL 1950 3rd Edition, listed cUL listed to CAN/CSA-C22.2 #950 EN60950:1992 A1-A4, A11:1996 plus deviations IEC950CB, IEC 60950:1991 A1-A4, A11 2nd Edition Low Voltage Directive (LVD) AS/NZS 3260 S-Mark (Argentina) EN60825-1 + A11:1996 FCC CFR 21, CDRH
Electromagnetic Interference/ Compatibility (EMI/EMC)	
Certifications and Standards	FCC CFR 47 Part 15 Class A CAN/ICES-003 Class A 89/336/EEC EMC Directive EN55022:1998 Class A CISPR22:1997 Class A EN55024:1998 includes IEC 6100-4-2, 3, 4, 5, 6, 11 EN6100-3-2, 3-3 VCCI Class A (Japan) AS/NZS 3548 (Australia/New Zealand) NOM/NYCE (Mexico) MIC Mark (Korea) GOST (Russia) CNS 13438 Class A (Taiwan)
Heat Dissipation	105 W maximum (358 BTU/hr maximum)
Power Supplies	
AC Line Frequency	50 Hz to 60 Hz
Input Voltage Options	85 VAC to 250 VAC
Current Rating	100-120/200-240 VAC 3/1.5 A
Switch Power-Off	
Temperature power-off	75° to 80° C (167° to 176° F)



Index

Numerics

10G6X module 56

A

airflow requirements 23
amperage, calculating 35
ANSI standards 36

B

BlackDiamond 10808 switch
 checking the installation) 70
 console port 46
 installing the chassis 41
 LEDs 40
 MAC address 39
 serial number 39
BlackDiamond 10808, general
 features 11
BlackDiamond switch, general
 I/O modules 53
 I/O modules, LEDs 57
BlackDiamond, general
 grounding 42
building codes 20
bundling cable 29

C

cable identification records 28
cable labeling 28
 identification 28
 records 28
cable manager 29
cable requirements
 bend radius
 fiber optic 30
 UTP 29
 meeting 28
cable types and distances 31
cabling standards 28, 36
 ANSI 36
 BISCI 28
checking the installation 70
commands
 clear log static 47
 synchronize 50

commercial building standards 36
configuring IP settings 77
console port
 MSM-1/MSM-1XL 46
 settings 75
conventions
 notice icons 8
 text 8

D

design standards 36
distribution rack requirements
 grounding the rack 26
 mechanical recommendations 26
 securing the rack 27
 service access 27
 space requirements 27

E

electrical codes 21
electrostatic discharge 25, 29
environmental requirements 22
ESD wrist strap 25
ESD, *See* electrostatic discharge

F

fan tray 73
 installing in a BlackDiamond 10808 switch 73
 removing from a BlackDiamond 10808 switch 72
features, BlackDiamond 10808 switch 11
fiber optic cable
 bend radius 30
 care 30
full-duplex 12

G

G60T module 54
G60X Module 55
grounding 36
grounding the BlackDiamond chassis 42

H

helper bracket, installing the BlackDiamond switch 41
humidity 24

I		
I/O modules, BlackDiamond		
description	53	
hot-swapping	58, 61	
installing	58	
LEDs	57	
removing	61	
verifying the installation	60	
industry standards	36	
installation		
BlackDiamond 10808 chassis	41	
BlackDiamond 10808 fan tray	73	
BlackDiamond 10808 switch	41	
BlackDiamond I/O modules	58	
connecting network interface cables	33	
helper bracket	41	
mini-GBIC	16	
MSM module	48	
slave MSM	50	
installing cable	29	
bend radius		
fiber optic	30	
UTP	29	
cable distances	31	
fiber optic cable	30	
slack	29	
IP settings, configuring	77	
L		
labeling system for cables	28	
LEDs		
BlackDiamond 10808 switch	40	
BlackDiamond I/O modules	57	
MSM-1/MSM-1XL	47	
M		
MAC address	39	
management port	12	
management port, MSM-1/MSM-1XL module	46	
media types and distances	31	
mini-GBIC	12	
installing	16	
removing	15	
safety	14	
specifications		
LX	13	
SX	13	
ZX	14	
MSM module		
installing	48	
MSM-1/MSM-1XL module		
booting	47	
console port	46	
description	45	
management port	46	
master, slave functionality	46	
removing	51	
saving configuration	46	
tools, installation	48	
tools, removal	50	
verifying the installation	50	
MSM-1/MSM-1XL module		
hot-swapping	48	
LEDs		47
O		
operating environment requirements	20	
building codes	20	
electrical codes	21	
wiring closet	22	
optical interfaces		
Class 1 laser device (warning)	81	
optical safety precautions	81	
optical-fiber cable connections	33	
P		
plenum-rated cable	29	
ports		
console port settings	75	
power cable, replacing	34	
power requirements	33	
dual power supplies	34	
power cable	34	
power supply	33	
power-on self test (POST)		
BlackDiamond 10808 switch (DC)	70	
R		
rack specifications		
grounding	26	
mechanical recommendations	26	
mounting holes	26	
securing to floor	27	
space requirements	27	
rack-mounting		
BlackDiamond 10808 chassis	41	
BlackDiamond 10808 switch	41	
radio frequency interference	29, 32	
related publications	9	
RJ-45 cable	32	
RJ-45 cable, connector jackets	32	
running cable	29	
bend radius		
fiber optic	30	
UTP	29	
cable distances	31	
fiber optic cable	30	
slack	29	
S		
safety information	79	
saving configuration, MSM-1/MSM-1XL module	46	
securing the rack	27	
serial number	39	
service access to the rack	27	
site planning process	20	
slave MSM, installing	50	
space requirements for the rack	27	
standards		
cabling	36	
commercial building	36	
grounding	36	
T		
temperature	22	

tools	
BlackDiamond 10808 fan tray installation	73
BlackDiamond 10808 fan tray removal	72
BlackDiamond I/O module installation	58
BlackDiamond switch rack installation	40
MSM-1/MSM-1XL installation	48
MSM-1/MSM-1XL removal	50

U

uninterruptable power supply	
calculating amperage requirements	35
features	35
selecting	35
transition time	35
UPS, <i>See</i> uninterruptable power supply	

W

wiring closet	
airflow requirements	23
electrostatic discharge	25
floor coverings	22
grounding	22
humidity	24
temperature	22
wiring terminals	26

